

THE IRON AGE

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A Machine Shop With Notable Features

New Six-Story Plant of the National Acme Mfg. Company, Cleveland—Electric Attachments, Novel Workbench Location and Space-Saving Floor Entrances

An interesting type of a modern machine shop, having various features that are regarded of unusual merit in shop arrangement and in the methods of routing and handling material and finished products, as well as along the lines of safety, has recently been built by the National Acme Mfg. Company,

is a one-story erecting shop of the same length and 55 ft. wide, the roof of which extends above the ceiling of the second floor of the main building. The balcony extends around this shop connecting with and being on the same level as the second floor of the main building. This makes the erecting shop a



A View of the Well Arranged Erecting Shop Directly Adjoining the Main Building Used for Erecting the Large Size Automatic Machinery and Having a Crane Runway that Provides Ample Room for Handling this Large Machinery

Cleveland, Ohio. The company's entire department for building automatic machinery, with the exception of the spindle department, is located in this building.

The shop occupies a fireproof structure constructed according to the latest factory design, 218 ft. long, 51 ft. 7 in. wide and six stories in height. The building has a steel frame reinforced with concrete and faced with red shale brick. Adjoining the main building as an extension to the first floor

continuation of the first floor of the main building and the balcony above the former a continuation of the second floor.

The convenient and space saving arrangement of the building in respect to the entrances to the various floors and to toilet-room facilities, etc., are interesting. There is a departure from the practice of having a centrally located time clock that must serve all employees on entering and leaving the plant, and which usually causes delay and crowd-



A View of the Assembly Floor Showing One of the Electric Conduits Suspended from the Ceiling with Outlets for Current for Portable Electric Drills and Lamps, Taking the Place of the Usual Column Outlets

ing. Instead, a time clock is provided on each floor for the men on that floor. There is an extension on one side of the building near one end to provide space for a wide inclosed iron stairway used by the workmen and given over to the toilet rooms on each floor, to an electric passenger elevator for the foremen, office employees and visitors, to a 5-ton, 8 x 12-ft. freight elevator and to a pipe shaft.

The time clocks, lavatories and steel lockers are located on each floor at the top of the stairs or close to points of entering and leaving the shop, the lavatories directly adjoining the toilet rooms located in the extension. A double row of white enameled iron wash basins is provided on each floor, fourteen bowls to the floor. A concrete floor is provided in the lavatories and toilet rooms and the units in the latter are divided by slate partitions. Another enclosed iron stairway is provided at the opposite end of the building for the convenience of the workmen in going from floor to floor. The shop is joined with the main factory building across the street by a covered concrete bridge which connects the two buildings at the third floor.

The building is provided with steel fireproof doors that shut off all stairways, and with Kinnear curtain type of doors at the entrances to the passenger and freight elevators, and is equipped with the General Fire Extinguisher sprinkling system, and also with an auto call system. All wiring is placed in conduits. A skylight is provided in the greater part of the roof surface of the erecting floor, and there is another skylight in the monitor section that extends the length of the main building above the top floor.

The ceilings are 15 ft. high on the first floor, 10 ft. high on the top floor and 12 ft. high on the intermediate floors. The building is divided into three 16-ft. 10-in. bays by two rows of 15-in. concrete columns spaced 12 ft. on centers lengthways. The lower parts of the columns are protected at the corners with steel. The floors are concrete slabs, the first floor ceiling being a 9½-in. slab and those above 8-in. slabs, designed to carry a dead load of 139 and 120 lb. per square foot respectively. The ground floor, including the erecting floor, and the second floor are covered with creosoted wood blocks, and the other floors with matched maple flooring. The erecting shop floor has a 10-in. concrete foundation, so that it is possible to install heavy machinery



Benches Are Placed Between the Columns on the Erecting Floor, Providing Twice the Amount of Space that Would Be Available Were the Benches Located Along the Side Walls

anywhere on this floor by removing the wooden blocks and without providing additional foundation for the machines. The ceilings and upper part of the walls are white enameled, and the columns and side walls to a height of 5 ft. are gray. These were recently adopted as standard colors throughout the entire plant, the bins and other equipment usually painted being in the slate color. The paint is a special preparation designed to bear washing when the walls become dirty, and was furnished by the Trun-Con Laboratories, Detroit, Mich.

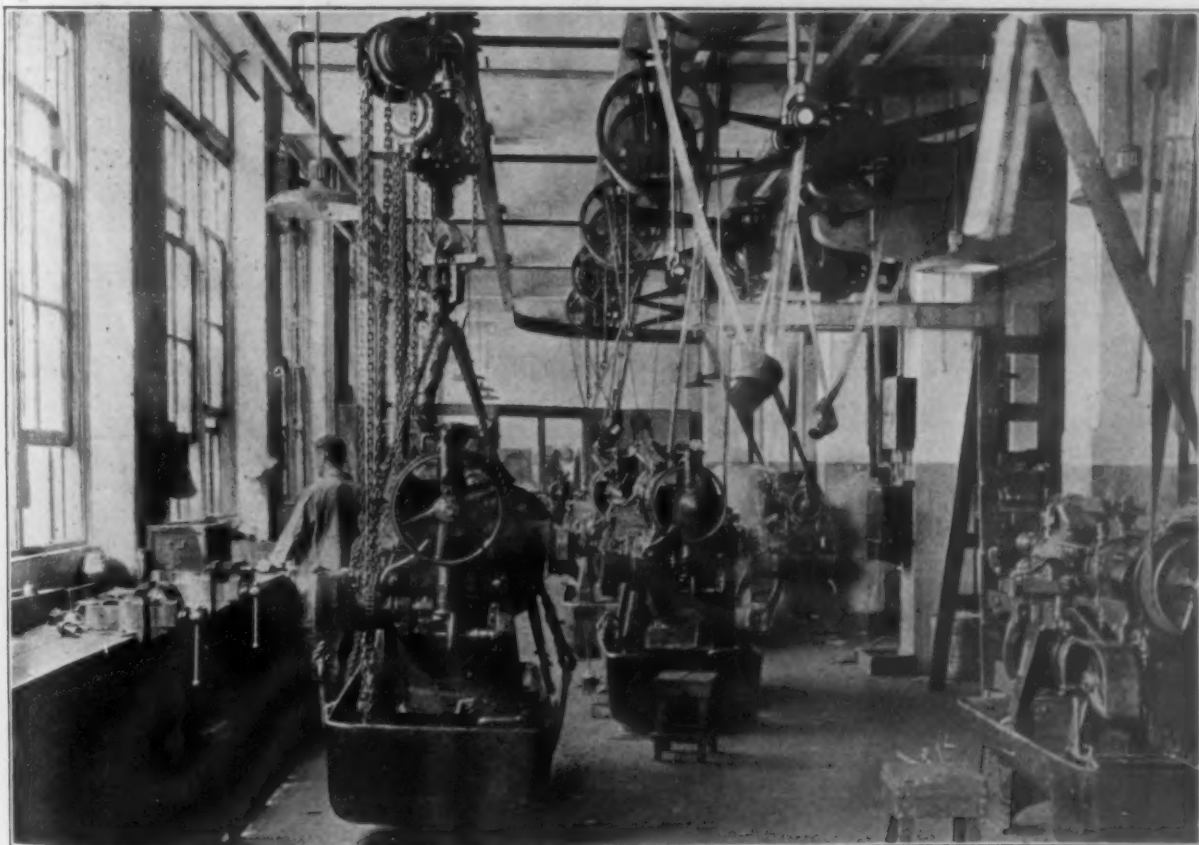
Material being routed through the shop for the various machine and assembling operations starts on the top floor and is moved downward. The chuck department and tool rooms are located on the sixth floor, lathe and grinding work is done on the fifth floor, milling on the fourth floor, small planer work and boring on the third floor, sub-assembling on the second floor, and erecting, final assembling and testing on the first floor. An up-to-date shop hospital is also located on the first floor, with a physician and nurse in attendance.

The erecting shop is a large well-lighted and well-arranged building. Its roof of concrete slabs and wired prism glass is supported by steel trusses. It is served by a 15-ton Pawling & Harnischfeger electric crane with a 3-ton auxiliary. The crane has a 40-ft. span, and its runway is 26 ft. above the floor, or about on a level with the second story ceiling of the main building. The balcony that extends around the erecting floor is 11 ft. wide and is inclosed with a wire railing or screen. Scraping and fitting are done on this balcony floor. The erecting floor is used largely for erecting the company's new 3 $\frac{3}{4}$ -in. automatic machines, that weigh complete about 25,000 lb. At the side of this floor at the edge of the balcony are located a number of heavy machines, including a 54-in. Colburn vertical boring mill, a 48-in. x 8-ft. Lucas precision horizontal bor-



The Switchboard, Showing Automatic Circuit Breakers that Take the Place of the Usual Switchboard with Knife Switches

ing mill, two 42-in. x 48-in. x 12-ft. and a 48-in. x 72-in. x 14-ft. Cincinnati planing machines. This machinery is all motor driven by direct-connected individual motors, all belt drive being eliminated on the floor except a few small lathes and shapers at one end beyond the crane runway.



The Testing Department on the Third Floor, Showing the Monorail Trolley and Track for Conveying Machinery from the Testing Floor to the Shipping Department and a Machine Suspended from the Hoist in a Sling Ready to go to the Shipping Room. Two lines of shafting in this bay for testing machinery are also shown

The machinery in the main building is driven from two motors on each floor, one for each line shaft. The motors are hung from the ceiling, and the line shafts are supported on post hangers attached to the sides of the building columns. Silent chain drive is provided, with metal guards around the chain.

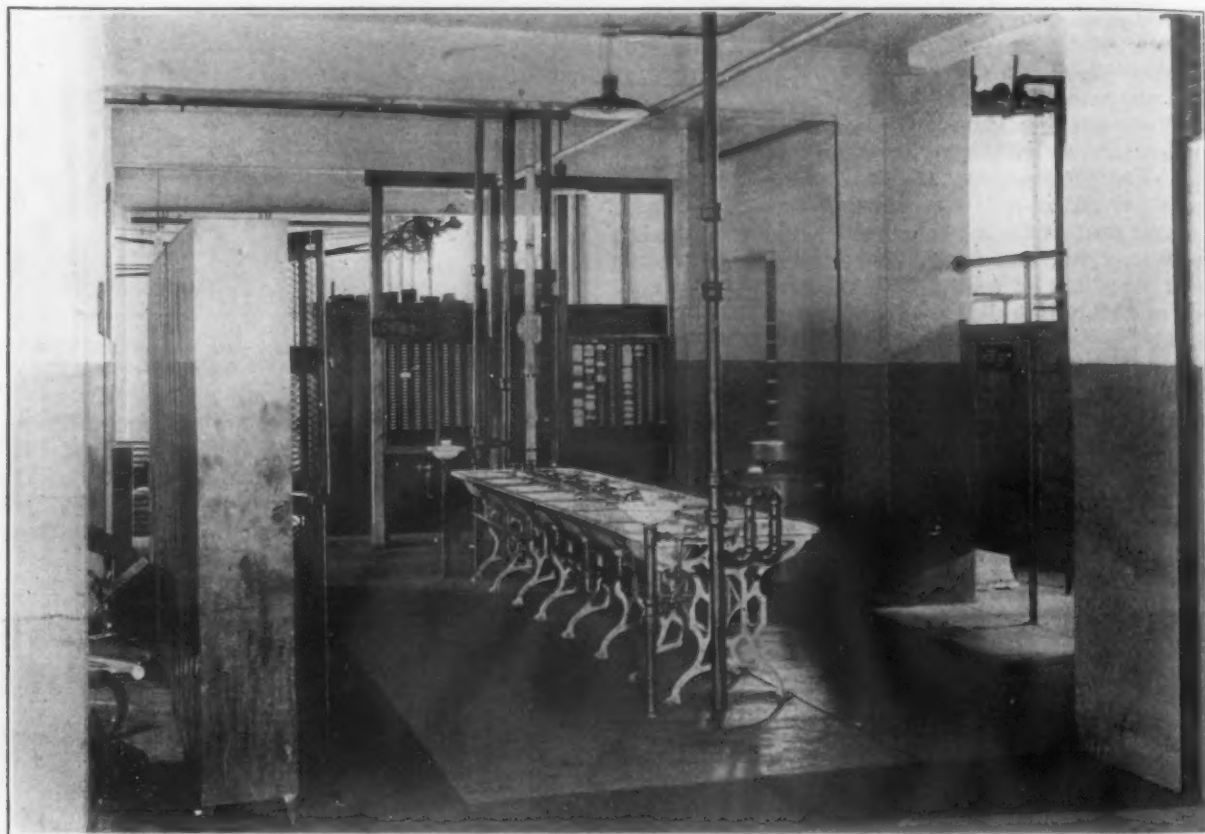
A departure from the usual shop arrangement is found in the bench room on the first floor, where the benches, instead of being located along the wall, are placed between the rows of concrete posts. This arrangement solved the problem of having sufficient bench space which otherwise would not have been available. These benches are placed between alternate columns along two rows of columns, leaving the alternate spaces clear. Each bench, 12 ft. long, is built around the columns to which it connects,

A Comparison of Steel Prices and Wages of Common Labor

(With Supplement)

THE IRON AGE is permitted to reproduce a chart recently prepared by the Republic Iron & Steel Company in which the fluctuations in prices of leading steel products in the years 1899 to 1915, inclusive, and in the first four months of 1916 are compared with wages of common labor at steel works in the same period. The steel prices used in plotting the diagram are the monthly averages taken from THE IRON AGE's quotations. The rates for common labor are those paid at steel works in the Middle West.

In connection with the chart, which is reproduced in the accompanying supplement, a curve is plotted



Typical Entrance to One of Shop Floors. Showing at the Head of the Staircase the Time-Clock, Lockers, Lavatory and Door to Toilet Room. Along the side wall back of the wash-stand is a steel tank supplied on each floor in which to dump liquid refuse

and provides bench space for three men on each side. The benches are supported by iron legs with a vise above each leg, insuring solid support for the vises. The legs and vises are placed in staggered positions, so that men on opposite sides doing such work as filing will not interfere with each other. It is figured that this arrangement provides twice as much space as would have been available had the benches been located along the side wall.

A machine shop novelty is provided in a circular steel tank about 36 in. in diameter, located on each floor near the wall adjoining the lavatory, in which is dumped the pails of water and pumice stone used in wet rubbing the machines and parts. In the old building this refuse was dumped into the plumbing water closets, which were frequently clogged by the large amount of solid matter contained in the pails. This material is dumped into a hopper at the top of the tank, the sides of the hopper extending down to nearly the bottom of the tank. The solid matter settles in the bottom and the liquid passes out

(Continued on page 129)

from a recent issue of the New York Times *Analyst*, showing the purchasing power of a \$10 bill in the years 1890 to 1915, inclusive. This purchasing power curve is significant in that it shows the almost uninterrupted decline in the period 1899-1915 covered by the price and wages chart.

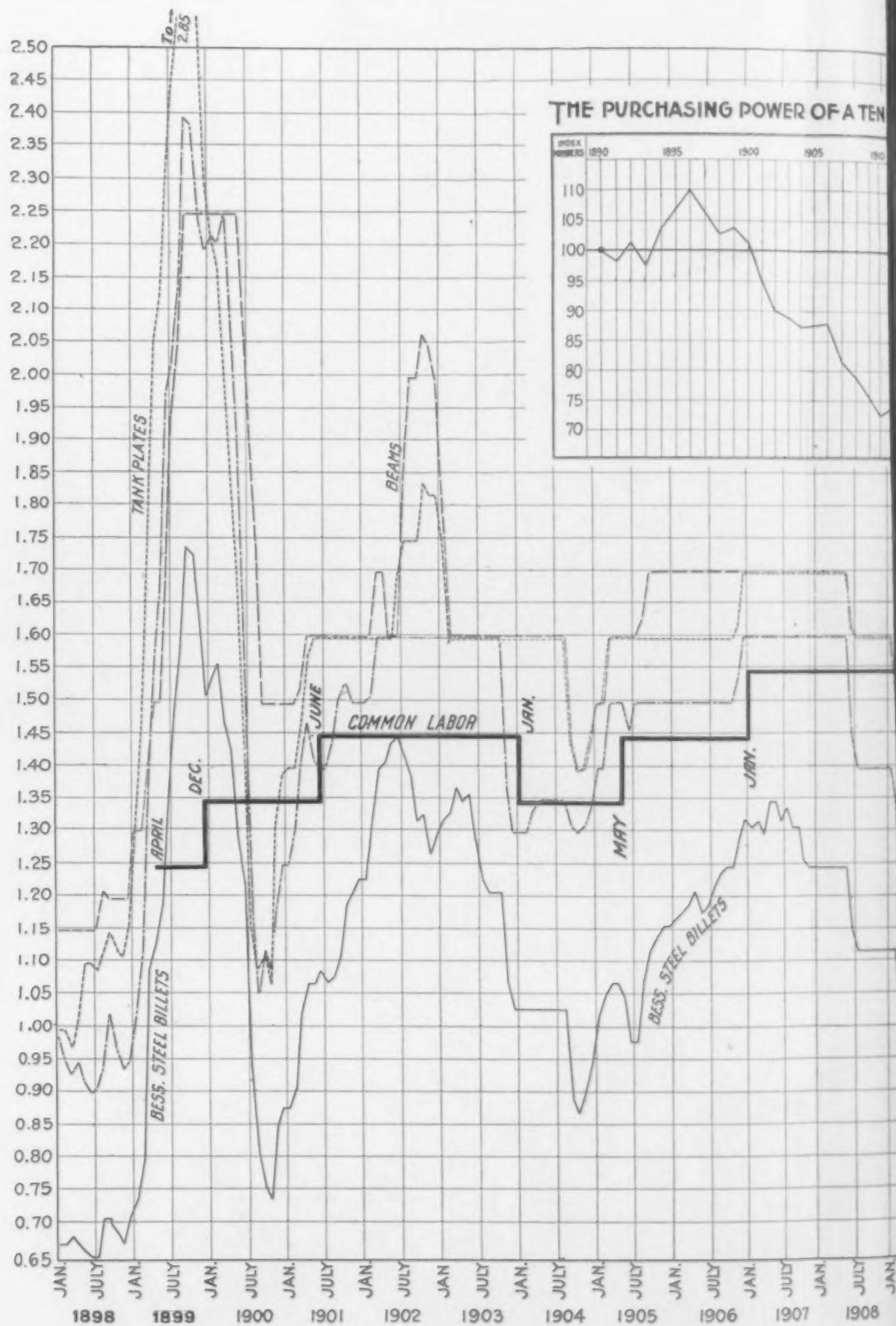
It is interesting to note that in the period from April, 1899, to April, 1916, the wages of common labor were reduced but twice; namely, in June, 1904, and April, 1909. The first of these reductions lasted until May, 1905, or nearly eighteen months, while the second was only of sixty days' duration. It may be remembered that in April, 1909, the independent steel companies reduced wages 10 per cent, but this 10 per cent was restored within sixty days. The striking feature of the heavy line on the chart, representing wages, is that the curve based upon it would show a strong upward sweep from a level of \$1.25 in 1899 to \$2.42 in 1916. Thus the wages of common labor have almost doubled. In the meantime the purchasing power of a dollar has declined from about 104 to 70, or about one-third.

FLUCTUATIONS IN PRICES OF STEEL PRODUCTS AND IN WAGES OF

(STEEL PRICES FROM THE IRON AGE'S TABLES, LABOR RATES COMPILED)

BESS. STEEL BILLETS ——— TANK PLATES ——— SOFT STEEL B.

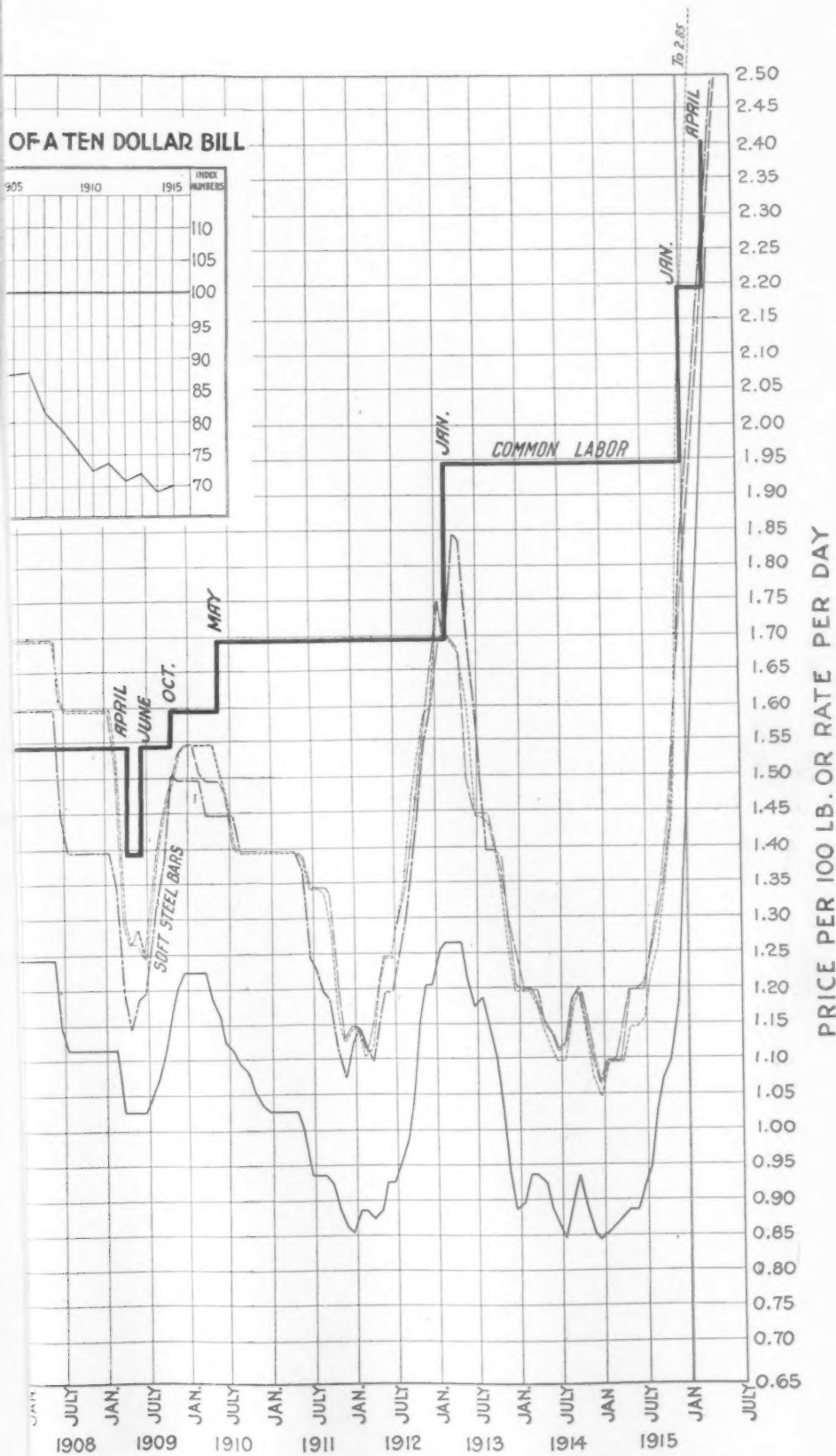
PRICE PER 100 LB. OR RATE PER DAY



CHANGES OF COMMON LABOR IN THE PERIOD 1899-1915

(COMPILED BY REPUBLIC IRON & STEEL COMPANY)

SOFT STEEL BARS ————— BEAMS —————



A Machine Shop With Notable Features

(Continued from page 128)

through an overflow pipe at the top and is discharged into a 5-in. waste pipe extending from the top of the building to the sewer system and independent of the lavatory and toilet-room waste lines. The tanks have hinged covers and vents so that odors from them will not escape. When the tanks become filled with solid material the tops are lifted off and the material is removed.

An efficient arrangement is provided for handling the finished machines from the final assembling and testing department to the shipping department, the latter a room, 70 x 100 ft. that extends from one end of the erecting floor. A monorail trolley track extends the length of the building near the outer wall of the assembly floor adjoining the final testing department. On this side of the assembly floor two rows of hangers are provided all complete for testing. This monorail curves around through the end of the erecting floor and out into the shipping room. The track is provided with two 2-ton Yale triplex hoists hooked in multiple. Slings are placed around the machines, and they are run out on these hoists to scales in the erecting shop, where they are weighed, and from there to the shipping floor, where they are crated. Large machines on the erecting floor after being crated are handled by a steel grapple placed over the crates. Headless screws on the bottom of the grapple grip into the bottom of the wooden crates, preventing slipping. This method of handling not only saves time, but the danger of accident resulting from the machine getting out of balance when lifted with chains is eliminated.

The electric control equipment is interesting in that instead of using ordinary knife switches, oil circuit breakers, more generally used for high-voltage lines, are provided for the low-voltage current, and each circuit has its own circuit breaker. The alternating current used enters the plant substation at a pressure of 11,000 volts, and is transformed to 440 volts. There are nine of these circuit breakers, of the Westinghouse type, on the oil-switch panel, one being provided for each floor, one for the crane and elevators and one for the lighting circuit, the current for the latter being stepped down to 110 volts through a secondary converter. The arrangement eliminates open switches, busbars and fuses. The panel is provided with a polyphase wattmeter. The switchboard, enclosed in a wire cage, is located at one corner of the erecting floor. Each motor has its own starting box and all switching off is at the motor. Starting boxes have no-voltage release attachments, so that no-voltage release relays are not required on the circuit breakers.

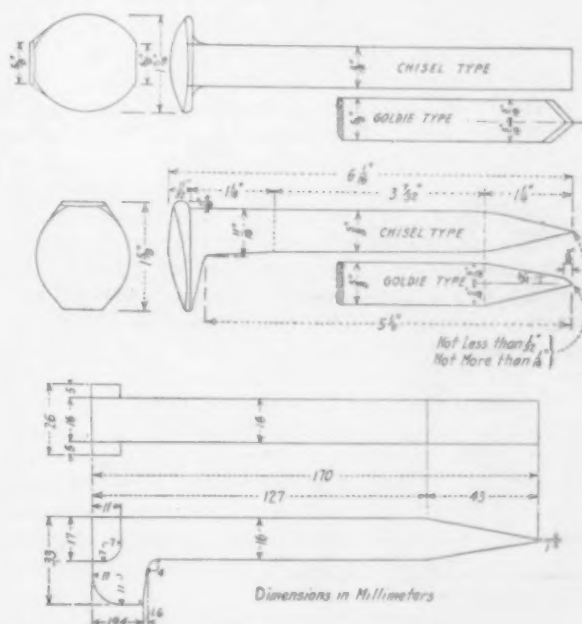
By having sufficient general overhead artificial lighting, drop lights are eliminated. The artificial lighting is provided for the most part by 100-watt lamps in 18-in. dome Abolite reflectors. These are placed in a row in the center of the balcony floor on a level with the roof trusses on 12-ft. centers, along the outside bays of the main building and in the center bay as needed. An original method of providing outlets for local lighting and for electric drills is found on the assembly floor. Instead of using plugs in the columns, metal electrical conduits are provided that extend from the ceiling to about 7 ft. above the floor or in easy reach of the workmen. These conduits have two outlets, so that a portable electric drill and lamp can be connected to the outlets at the same time. These overhead outlets for the electric current are found much more con-

venient for the men on the assembly floor than a column outlet, and they permit the use of shorter cords and keep the aisles free of cords over which workmen are apt to stumble. Outlets are also provided in the alternate building columns for use if needed. Similar overhead conduits with one outlet for lights are provided above the planers on one of the upper floors.

The Russian Dog-Eared Railroad Spike

The dog-eared railroad spike in standard use on the Russian railways, and now being manufactured in large quantities in this country for export to Russia, is being tried out by the New York Central Railroad, which has distributed over 150 kegs to five divisions on its lines. The only instruction given to the supervisors was to use them. Reports from the track maintenance corps have in nearly every case been favorable, and the indications are that with certain variations this type of spike may replace the standard now universally used.

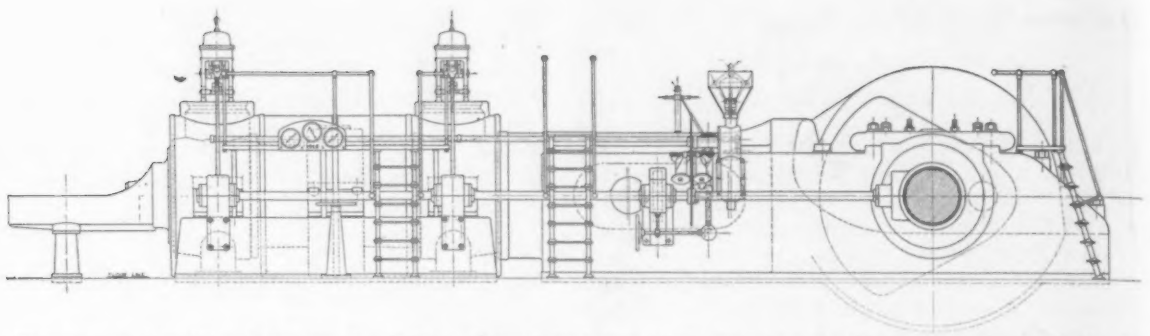
The standard track spike is 6 1/16 in. long, 5/8 in. square and has a flat, rounded head, offset to give a bearing surface on the rail base of about 7/8 in. It



The Standard American Track Spike of the Chisel Type and the Russian Spike, Showing the Radical Difference in the Design of the Spikehead

weighs about 12½ oz. The Russian spike has the same-sized shaft as the American, and is about ⅝ in. longer. Both are of the chisel type, but the Russian spike has nearly ½ in. longer taper, as the foreign specification requires that the spike can be driven and pulled six times each way in an oak tie. Both have about the same weight, but the Russian spike has a bearing surface on the rail of only about ⅝ in. It has, however, a depth of head of over ¾ in. as against that on the American spike which varies from 11/32 to 9/16 in.

The head of the dog-eared spike has two distinct advantages that have appealed to American railroad men. The first is that its shape enables it to resist corrosion, as from brine, much better than the thinner head on the American standard spike. It is also much easier to pull, as the ears are at the top of the head, which is much higher than the American spike head, and therefore stands out above the shoulder of the tie plate, enabling the track man to pull it more quickly and readily. Some complaint has been made that the flat top is not a good surface to take the blow in driving, which tends to break off the ears. These objections are considered well founded, but it is believed that by putting a bulge upon the top and with one or two other minor changes the new type of spike will prove superior.



Elevation of a Uniflow Steam Engine Built to Drive a Rod Mill at the Plant of the Youngstown Sheet & Tube Co.

UNIFLOW ENGINE FOR ROD MILL

First American Installation for This Service to Be Made at Youngstown

BY O. J. ABELL

In the adaptation of the uniflow engine to rolling mill drive, practice in this country has followed that of Germany, as it has in numerous other respects. The first engines of this type to be built for rolling mill service in this country have just been completed and shipped by the Nordberg Mfg. Company, Milwaukee, for the Youngstown Sheet & Tube Company. The larger of the two engines will drive a 12-in. Morgan continuous rod mill and the smaller a 9-in. rod mill. At the Röchling Steel & Iron Works, Völklingen, a 30-in. three-high mill is being driven by a unit of this type, the engine operating under an average load of 4000 hp. but having a maximum continuous capacity of 6300 hp. and a short duration peak load capacity of 8000 hp. Under wide variations of load, as in that German installation and also under extreme overloads, a minimum increase in steam consumption, as indicated in the characteristic flat steam consumption curve, is the prominent feature of advantage which renders the uniflow engine so suitable to mill drive where sharpest fluctuations of load are almost continuous. Tests have shown that a 200 per cent load can be carried with a 10 per cent increase in steam consumption.

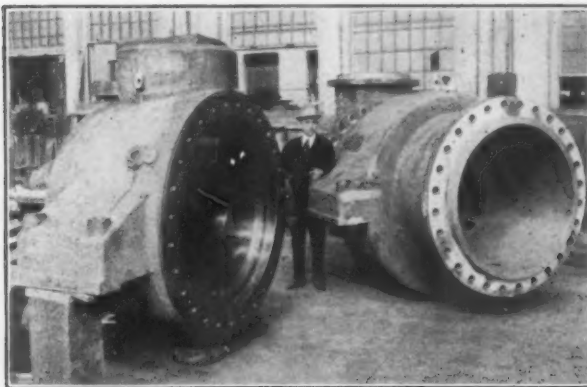
As is now very generally appreciated, this type of engine is highly efficient, the peculiar design of the cylinder contributing to a minimum loss of steam from initial condensation. As indicated in the accompanying cross-section, the exhaust steam ports are located centrally in the cylinder, the one row of ports alternately exhausting at either end of the cylinder as the piston uncovers the ports at one or the other end of its travel. The cylinder heads, therefore, are in contact only with live steam

and are farthest removed from the steam at its low temperature point so that they are not cooled down prior to the admission of the high-pressure steam, and condensation is a minimum. It also follows that this type of cylinder is adapted to a maximum range of temperature between the admission and exhaust, or, in other words, admits of a maximum expansion of the steam. In this respect this engine is comparable with the tandem-compound type and has the important added advantage of requiring much less piping in the way of connections and much less floor space per horsepower.

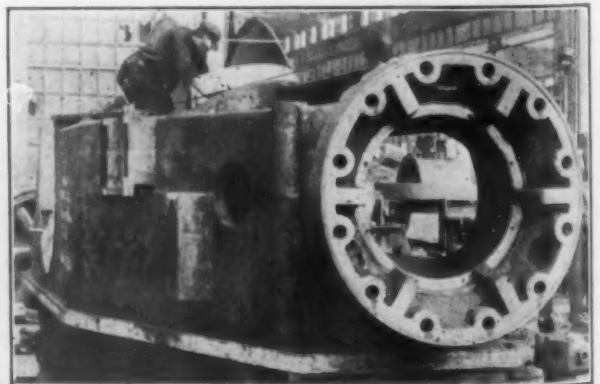
This Nordberg engine is a horizontal Tangye frame, single poppet valve, uniflow cylinder type with side crank and flywheel arranged to run under. Its design is entirely that of a heavy-duty unit, the general sizes and specifications of the two engines being as follows:

	Large Engine	Small Engine
Brake horsepower at 20-in. vacuum:		
Average	1,400	600
Maximum	2,100	1,600
Speed, r.p.m.	65-110	55-110
Diameter of cylinder, in.	44	37
Stroke, in.	50	48
Shipping weight, lb.	480,000	360,000
Weight of frame, lb.	108,085	74,340
Weight of cylinder, lb.	19,005	.....
Weight of front cylinder head, lb.	14,240	.....
Weight of rear cylinder head, lb.	14,155	.....
Normal steam pressure, lb.	170	170
Normal superheat, deg. Fahr.	75	75
Maximum steam pressure, lb.	200	200
Maximum superheat, deg. Fahr.	100	100
Diameter of main and outboard bearings, in.	25	20
Length of main and outboard bearings, in.	40	36
Size of crank pin, in.	14 x 15	12 x 12
Size of cross-head pin, in.	10 x 16	8 1/2 x 14
Diameter of hollow piston rod, in.	13	10
Diameter of flywheel, ft.	16	10
Weight of flywheel, lb.	110,000	90,000

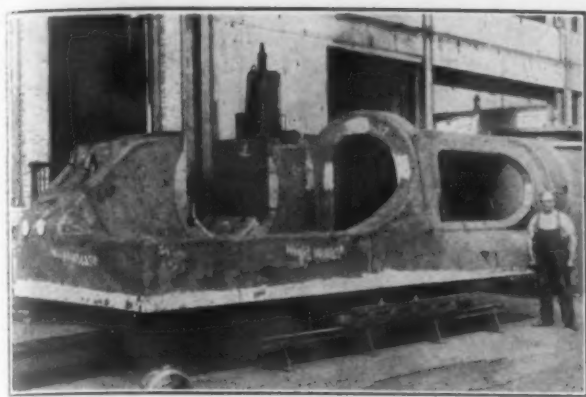
The general design of the cylinders is shown by the longitudinal section of the cylinder and in the view of the cylinder and cylinder head. The cylinder is a plain cylindrical casting, all valve chambers and steam passages being contained in the heads, which are bolted to the cylinder. This prevents distortion and strains due to expansion and contraction with the use of high pressures and super-



View of the Cylinder Head and the Cylinder of the Larger Engine before Assembling, Which Illustrates the Massive Design of the Castings



End View of the Large Frame Showing the Heavy Reinforcement of the Flange to Which the Rear Cylinder Head Is Bolted



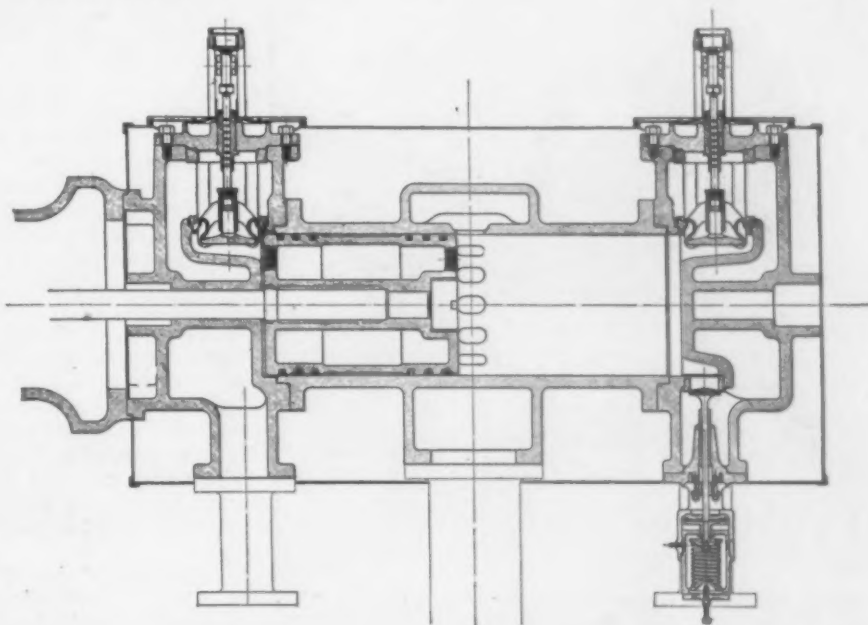
The Bed of the Larger Engine Mounted on the Table of a Large Combination Drilling and Facing Machine

Steel Wheels for 'Army Trucks

In a paper on "Automobile Experiences in the Great War," presented at the semi-annual meeting of the Society of Automobile Engineers, June 12 to 16, W. F. Bradley, European correspondent for the *Class Journal* Company, New York, discusses as follows the extent to which metal wheels for automobiles are being adopted in place of wooden ones:

One of the most important developments of the war is the adoption of the all-metal in place of the wood wheel. Although the wood wheel may continue in use for some years on commercial trucks, and possibly will not be abandoned for touring-car purposes, it is already doomed for army trucks. The primary objection to the wood wheel is that, even if well made of good material, in the first instance, it requires attention from time to time to keep it in proper condition.

heats. The cylinder walls are of a thickness sufficient to reserve ample strength after all necessary reboring during the life of the engine. The steam valves are of the double beat, balanced poppet type, the valve cages being separate castings which are ground into the heads with a steam-tight joint. No packing is required for the valve stems, which are accurately ground and polished and work in ground and lapped bushings. The valves are operated from a lay shaft by a releasing valve gear with spring dashpots, the cut-off being under control of the governor through the wide range of loads. The speed regulation controls within a 4 per cent fluctuation at full load.



Cross-Section of Uniflow Type Engine Cylinder Showing the Large Heads and the Centrally Located Exhaust Ports and Exhaust Belt

The steam enters the cylinder heads at the bottom, all piping being carried under the engine room floor, sweeping up over the heads and jacketing them before entering the valve at the top. The exhaust is through the ports in the center of the cylinder, uncovered by the piston near the end of its stroke, an encircling exhaust belt delivering to the sub-floor pipe. Relief valves of the poppet type with a cataract dampening device are located near the bottom of the heads. In case of loss of vacuum and overcompression these valves automatically open and connect the clearance space of the cylinder with the steam space in the head and the communicating steam piping.

The casting of the principal parts of these engines, the frames, cylinders and cylinder heads, involved unusually exacting requirements in the matter of core work. The castings were poured in dry sand. All ribbing and reinforcing of the frame was done with cores on the inside of the casting and the segmental flywheels were cast entirely in cores.

Tests of the web strains in I-beams and girders have been conducted at the Engineering Experiment Station of the University of Illinois on a number of 12-in. beams and 24-in. built-up girders. The investigations were conducted by Prof. H. F. Moore and Prof. W. M. Wilson, and the results are described in bulletin No. 86, copies of which may be obtained upon application to W. F. M. Goss, director, Urbana, Ill.

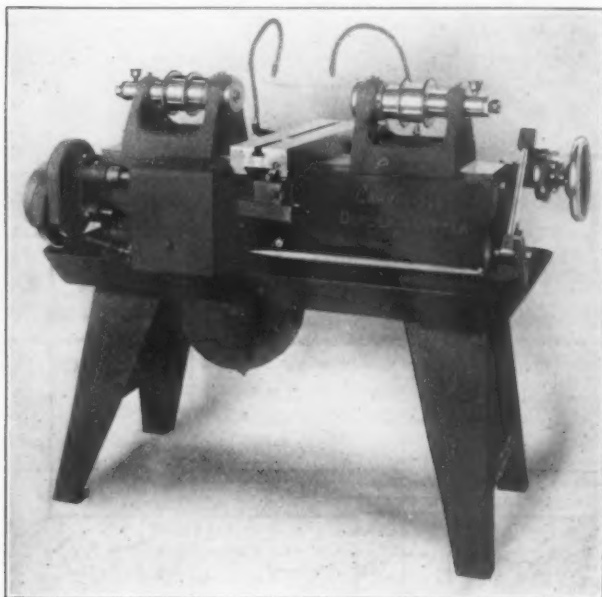
This defect is most apparent when the trucks have to remain out of doors day and night, indeed on all occasions except when in the repair shop. Another objection is that if the vehicle catches fire—and the enemy's guns are constantly on the search for convoys working back of the lines—the wheels are liable to be destroyed, and it becomes a difficult matter, if not an impossibility, to get the truck away. With metal wheels it is nearly always possible, when the fire has burned itself out, to tow the vehicle home. Apart from the body, it is surprising how little a burned-out truck will suffer in its essential organs.

Practically no army trucks are now being built in Europe with wood wheels. All the Austin and other trucks supplied to the Royal Naval Air Service for use in France in a short time had their wood wheels changed for those of the steel-disk type. Generally, when replacements become necessary, cast-steel or disk wheels are substituted for wood. A small number of American trucks have been changed in this way.

For trucks of 3½-ton capacity and upward the cast-steel wheel of the spoke variety is extensively employed by French and Italian makers, and also by the British. The latter, however, are also partisans of the disk type. For the lighter units, such as light trucks on twin pneumatic tires, and motor ambulances, the steel-disk wheel has made a remarkable jump into favor. These pneumatic-shod wheels can be detached by removing four to six nuts. Incidentally, four studs and nuts, adopted by some makers, are considered an insufficient attachment. Six should be a minimum. The detachable wire-spoke wheel has not been given a more extended application, although it has held its own on touring cars used by staff officers.

Automatic Duplex Slot Milling Machine

A recent addition to the line of machine tools built by the Garvin Machine Company, Spring and Varick Streets, New York, is a duplex slotting machine. It is entirely automatic in operation, and once the piece to be machined is put in place no further attention is required on the part of the operator, the machine stopping as soon as a slot has been cut. Among the work that can be handled is the milling of drift slots in spindles and elongated holes in toolpost slots, the cutting of keyways, the slotting of castings, tools, etc., the making of mortise cuts and open fork ends and taking cuts in both ends of a single piece of work where it is necessary that the slots be in line. As the work can be done from both sides at once, the time required is, of course, correspondingly reduced and it is also possible to handle two sepa-



A Full Automatic Duplex Machine for Milling Slots in Spindles and Tool Posts, Making Mortise Cuts and Simultaneously Taking Cuts in Both Ends of a Piece

rate pieces at once automatically and without effort on the part of the operator. As compared with the old method of jig drilling and slotting out, partial sawing out or butt milling, the new machine is said to effect a material saving in time.

A cam and adjustable lever provide for the movement of the table at a uniform speed, and the length of stroke can be varied between $\frac{1}{4}$ and 4 in. conveniently and quickly. Speed changes are provided by a cone pulley and a set of change gears, short slots being reciprocated quickly and longer ones at a slower rate. The cam has a large sized groove in which a hardened roller rests and is driven by a worm gear.

The spindle heads are designed for high-speed work and the spindles taper at both ends. They run in solid bronze boxes having an adjustment for wear and a hardened step bearing to take the thrust. Each head can be adjusted independently on the bed to take care of different lengths and conditions of cutters, the position of the work on the table, etc. Simultaneous movement of the headstocks is provided by a handwheel, and it can be adjusted in or out to any distance without interfering with the setting of the machine. The heads are fed into the cut simultaneously and automatically by a right and left pitch screw controlled by a ratchet wheel. When the work of milling a through slot is almost completed one of the heads is backed away automatically, thus enabling the other to continue to advance and complete the slot. In this way, it is pointed out, no partition is left in the bottom. The feed is by a pawl and ratchet and can be adjusted, as well as arranged to lift out automatically and stop feeding when the required depth of cut is reached. Feeding takes place at each end of the stroke and it is emphasized that uniformity of the product is secured without depending on the operator. The work can be set at any angle on the table to produce a taper end of the slot. Two-prong fishtail cutters are

used to produce slots ranging from $\frac{1}{4}$ to $1\frac{1}{2}$ in. in width, and the changes of speed for different sizes of cutter are provided by a friction cone pulley on the countershaft.

All the working parts of the machine are located outside of the bed and are readily accessible. The equipment regularly furnished with the machine includes a steel oil pan with tank and strainer and pump and piping. Adjustable fixtures for holding round work up to 4 in. in diameter can be supplied at a slight extra cost.

Crompton & Knowles Pension Plan

The Crompton & Knowles Loom Works, employing 2,000 hands in its plant at Worcester, Mass., and 600 in its factory at Providence, R. I., has issued notice of a pension plan effective from July 1, based on the average monthly wages and length of service of the employees. As the company lost many old employees at the time of the general machinists' strike in Worcester last September, one portion of the text of the notice extends the benefits of the pension plan to these men if they are again in the company's employ by Aug. 15. As the business has been long established, and many men old in years and long in service are in its employ, the text of the notice, as given below, is of interest as showing the conditions which have actuated the company in instituting the pension system.

"Many of the largest labor employing concerns of the country will not hire a new employee over 45 years of age, no matter how experienced he may be, and while there may be occasions when experienced men beyond this age may get temporary employment, in normal times many avenues of employment will be closed because of age. Furthermore, with the necessity of physical examination as a condition of employment, as now required by many employers, it will be increasingly difficult to obtain employment.

"In view of the above, the company feels it is especially fitting at this time to establish a liberal pension plan for its employees, and trusts that it will furnish them an added incentive for faithful and efficient service.

"An idea of the material benefit of this pension plan will be apparent when it is considered that a retired employee who obtains the minimum pension will receive each year an amount equal to the income from \$4,500 at the usual savings bank rate of interest, namely, 4 per cent.

"A retired employee who has had an average wage, prior to retirement, of \$60 per month, will receive on this basis an amount equal to the income from \$4,500, if he has had 25 years of service; if 30 years of service, an amount equal to the income from \$5,400; if 35 years of service, an amount equal to the income from \$6,300; if 40 years of service, an amount equal to the income from \$7,200.

"If the average wage of the employee who is retired has been more than \$60 per month, the principal represented by his pension income is correspondingly increased.

"In consideration of the fact that, due to the abnormal conditions of the past year, many former employees to whom this pension plan would be of vital consequence are now in other fields, and in further view of the fact that it is the desire of the company that this recognition of our employees be as comprehensive as possible, it has been decided to reinstate such former employees for whom places can be found, and give them full credit for their former service in their pension records, providing such reinstatement be made before Aug. 15, 1916."

The Brown Hoisting Machinery Company, Cleveland, is erecting for the Donner Steel Company, Buffalo, two 251-ft. electric ore handling bridge cranes equipped with man trolleys, and is extending a crane now in use in the steel plant to the same length as the two new cranes. The company also has a contract for trestles and coke bins. In addition it has recently taken orders for a rotating cantilever electric crane to be shipped to Japan, an ore bridge for the Dominion Iron & Steel Company, Sidney, N. S., and a bridge for the General Chemical Company, Chicago.

New Extras on Steel Bars and Small Shapes

The standard classification of extras on steel bars and small shapes, issued on July 1 by the Carnegie Steel Company, gives a new classification for channels, with an increase in the extras, and also a new classification for tees and for ovals. It divides the former table of half ovals and half rounds into separate tables. The hexagons now include a 3-in. hexagon at the top and $\frac{1}{4}$ -in. hexagon at the bottom of the range of sizes. New extras are also asked for machine cutting. The extras for rounds and squares, for flats, for angles and for bands remain as they have been. Some of the new classifications, which are the first since the classifications issued Sept. 1, 1909, are as follows:

Channels

$1\frac{1}{2}$ in. and wider, but under 3 in. wide x $\frac{3}{16}$ in. and heavier	0.15c. extra
$1\frac{1}{2}$ in. and wider, but under 3 in. wide x $\frac{1}{4}$ in.	0.25c. extra
$1\frac{1}{2}$ in. x $\frac{3}{16}$ in. and heavier	0.25c. extra
1 to $1\frac{1}{4}$ in. x $\frac{1}{2}$ in.	0.35c. extra
1 to $1\frac{1}{4}$ in. x $\frac{7}{64}$ in.	0.50c. extra
1 to $1\frac{1}{4}$ in. x $\frac{3}{16}$ in. and heavier	0.30c. extra
$\frac{3}{4}$ and $\frac{1}{2}$ in. x $\frac{1}{4}$ in.	0.40c. extra
$\frac{3}{4}$ and $\frac{1}{2}$ in. x $\frac{7}{64}$ in.	0.55c. extra
$\frac{3}{4}$ and $\frac{1}{2}$ in. and heavier	1.20c. extra
$\frac{3}{4}$ x $\frac{3}{32}$ in.	1.40c. extra
$\frac{1}{2}$ x $\frac{7}{64}$ in. and heavier	1.80c. extra
$\frac{1}{2}$ x $\frac{5}{64}$ in.	2.00c. extra

For intermediate sizes, the next higher extra to be charged in all cases.

Tees

$1\frac{1}{2}$ x $1\frac{1}{2}$ in. and wider, but under 3 in. wide x $\frac{3}{16}$ in. and heavier	0.20c. extra
1 x 1 to $1\frac{1}{4}$ x $1\frac{1}{4}$ x $\frac{3}{16}$ in. and heavier	0.40c. extra
1 x 1 to $1\frac{1}{4}$ x $1\frac{1}{4}$ x $\frac{1}{8}$ in.	0.50c. extra
$\frac{3}{4}$ x $\frac{3}{4}$ x $\frac{3}{16}$ in.	0.50c. extra
$\frac{3}{4}$ x $\frac{3}{4}$ x $\frac{1}{4}$ in.	0.60c. extra
$\frac{3}{4}$ x $\frac{3}{4}$ x $\frac{3}{16}$ in.	0.60c. extra
$\frac{3}{4}$ x $\frac{3}{4}$ x $\frac{1}{2}$ in.	0.70c. extra
$\frac{3}{4}$ x $\frac{3}{4}$ x $\frac{1}{4}$ in.	1.30c. extra
$\frac{1}{2}$ x $\frac{1}{2}$ x $\frac{1}{2}$ in.	1.80c. extra

Unequal leg tees are subject to special prices, which will be furnished on application.

For intermediate sizes, the next higher extra to be charged in all cases.

Hexagons

$\frac{3}{4}$ to 3 in.	0.15c. extra
$\frac{3}{4}$ to $1\frac{1}{16}$ in.	0.25c. extra
$\frac{1}{2}$ to $\frac{9}{16}$ in.	0.35c. extra
$\frac{7}{16}$ in.	0.55c. extra
$\frac{3}{4}$ in.	0.65c. extra
$\frac{5}{16}$ in.	0.75c. extra
$\frac{1}{4}$ in.	1.00c. extra

For intermediate sizes, the next higher extra to be charged in all cases.

Half Rounds

1 to 3 in.	0.20c. extra
$\frac{3}{4}$ to $1\frac{1}{16}$ in.	0.35c. extra
$\frac{1}{2}$ to $\frac{9}{16}$ in.	0.50c. extra
$\frac{1}{2}$ to $\frac{9}{16}$ in.	0.70c. extra
$\frac{3}{8}$ to $\frac{7}{16}$ in.	1.10c. extra

For intermediate sizes, the next higher extra to be charged in all cases.

Half Ovals

Gauges shown are Birmingham Wire Gauge.

1 to 4 in. x $\frac{1}{4}$ in. and thicker	0.25c. extra
1 to 4 in. x Nos. 7, 8, 9 and $\frac{3}{16}$ in.	0.35c. extra
1 to 4 in. x Nos. 10, 11, 12 and $\frac{1}{4}$ in.	0.50c. extra
$\frac{3}{4}$ to $1\frac{1}{16}$ in. x $\frac{3}{16}$ in. and thicker	0.50c. extra
$\frac{3}{4}$ to $1\frac{1}{16}$ in. x Nos. 10, 11, 12 and $\frac{1}{4}$ in.	0.65c. extra
$\frac{3}{4}$ to $1\frac{1}{16}$ in. x Nos. 13, 14 and 15	0.80c. extra
$\frac{3}{4}$ to $1\frac{1}{16}$ in. x $\frac{5}{32}$ in. and thicker	0.60c. extra
$\frac{3}{4}$ to $1\frac{1}{16}$ in. x Nos. 10, 11, 12 and $\frac{1}{4}$ in.	0.75c. extra
$\frac{3}{4}$ to $1\frac{1}{16}$ in. x Nos. 13, 14 and 15	0.90c. extra
$\frac{1}{2}$ to $\frac{9}{16}$ in. x $\frac{1}{4}$ in. and thicker	0.80c. extra
$\frac{1}{2}$ to $\frac{9}{16}$ in. x Nos. 13, 14 and 15	1.05c. extra
$\frac{3}{4}$ to $\frac{7}{16}$ in. x $\frac{3}{32}$ in. and thicker	1.35c. extra
$\frac{3}{4}$ to $\frac{7}{16}$ in. x Nos. 14 and 15	1.60c. extra

For intermediate sizes, the next higher extra to be charged in all cases.

Ovals

$\frac{3}{4}$ to $2\frac{1}{2}$ in. x $\frac{3}{4}$ in. and thicker	0.20c. extra
$\frac{3}{4}$ to $2\frac{1}{2}$ in. x $\frac{1}{4}$ in. to $\frac{5}{16}$ in.	0.30c. extra
$\frac{3}{4}$ to $2\frac{1}{2}$ in. x $\frac{5}{32}$ in. to $\frac{3}{16}$ in.	0.45c. extra
$\frac{3}{4}$ to $1\frac{1}{16}$ in. x $\frac{5}{16}$ in. and thicker	0.35c. extra
$\frac{3}{4}$ to $1\frac{1}{16}$ in. x $\frac{3}{16}$ in. to $\frac{1}{4}$ in.	0.50c. extra
$\frac{3}{4}$ to $1\frac{1}{16}$ in. x $\frac{1}{4}$ in. to $\frac{5}{32}$ in.	0.65c. extra
$\frac{1}{2}$ to $\frac{9}{16}$ in. x $\frac{1}{4}$ in. and thicker	0.55c. extra
$\frac{1}{2}$ to $\frac{9}{16}$ in. x $\frac{1}{4}$ in. to $\frac{3}{16}$ in.	0.70c. extra
$\frac{1}{2}$ to $\frac{9}{16}$ in. x $\frac{3}{32}$ in.	0.95c. extra
$\frac{3}{4}$ to $\frac{7}{16}$ in. x $\frac{3}{16}$ in. and thicker	0.95c. extra
$\frac{3}{4}$ to $\frac{7}{16}$ in. x $\frac{1}{4}$ in. to $\frac{5}{32}$ in.	1.20c. extra
$\frac{3}{4}$ to $\frac{7}{16}$ in. x $\frac{3}{32}$ in.	1.45c. extra

For intermediate sizes, the next higher extra to be charged in all cases.

Machine Cutting Rounds and Squares $1\frac{1}{4}$ In. and Larger to Specified Lengths

Machine cutting to lengths over 48 in.	0.15c. extra
Machine cutting to lengths over 24 in. to 48 in., inclusive	0.25c. extra

Machine cutting to lengths over 12 in. to 24 in., inclusive 0.35c. extra
Machine cutting to lengths of $\frac{1}{2}$ in. and less, extra will be furnished on application, but will not be less than 0.45c.

The above extras apply only to .50 carbon and under.

Extras for machine cutting over .50 carbon will be furnished on application.

Extras for machine cutting rounds and squares under $1\frac{1}{4}$ in., flats, etc., will be furnished on application.

Cutting to Specified Lengths

Other than Machine Cutting

Cutting to lengths of 60 in. and over	No charge
Cutting to lengths over 48 in. to 59 in., inclusive	0.05c. extra
Cutting to lengths over 24 in. to 48 in., inclusive	0.10c. extra
Cutting to lengths over 12 in. to 24 in., inclusive	0.20c. extra
Cutting to lengths of 12 in. and less, extra will be furnished on application, but will not be less than	0.30c.

Increasing the Yield of Gasoline

The late increase in the price of gasoline is ascribed in a paper by W. R. Hamilton, to be presented at the Arizona meeting of the American Institute of Mining Engineers in September, to the following causes: 1. A decrease in the production of refinable oil of about 6,000,000 gal. in 1915. 2. Steadily increasing consumption. 3. Discontinuance of gasoline imports. 4. Heavy exports to Europe.

An increase in the production of gasoline may come possibly from the following sources: 1. Increased production of light oil. This promises nothing more than temporary relief. 2. Increased production of casing-head gasoline, or the recovery of the lighter hydrocarbons usually lost in oil production by volatilization. New production of gasoline from these sources is limited and cannot be expected to have any marked effect. 3. Lowering the grade of market gasoline, by which is meant the including of high point fractions in gasoline as the cut is made at the refinery. Before the demand for gasoline increased, the gravity of market gasoline was 65 or 70 deg. Baumé. The boiling point of "last over," or "end point" of the distillation of such gasoline was little higher than 200 deg. Fahr. The present standard is now over 59 to 61 deg. Baumé with an end point of 320 to 380 deg. Fahr. The production of marketable gasoline has thereby been increased. This cut can be still further widened and the production thereby probably increased from 30 to 50 per cent. 4. Innovations in refining methods such as the Rittman, Burton, Snelling and other processes. The Burton process, controlled by the Standard Oil Co., has not been successfully applied to California asphaltic oils, where the presence of a large proportion of saturated hydrocarbon has introduced problems not found in Eastern oils.

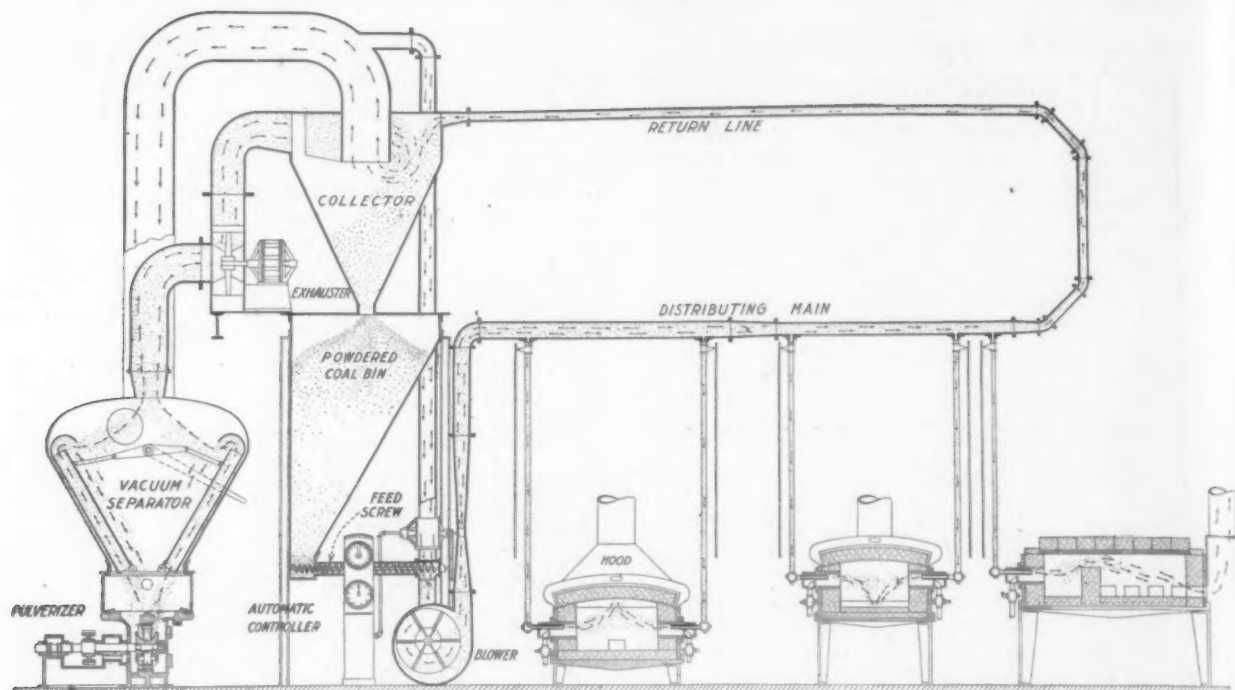
The Rittman process differs from the others in that the action takes place after the liquid has been vaporized. By subjecting the vapor to pressure and heat, a rearrangement of the molecules is effected, liberating the carbon which is removed from the plant without difficulty.

Of the processes making use of a catalytic agent, the McAfee process, controlled by the Gulf Refining Company, is the most promising. The catalytic agent used is aluminum sulphate and results from experimental work are said to be excellent.

Structural Business in June

The records of the Bridge Builders & Structural Society, as collected by its secretary, George E. Gifford, 50 Church Street, New York, show that in June 58 per cent of the entire capacity of the bridge and structural shops of the country was put under contract.

This makes June the leanest month in new fabricated projects since February, 1915. In the fifteen months intervening business has been closed at the rate of about 138,000 tons monthly, while June's total is about 100,000 tons. In March, April and May of 1915, as plant extensions under the influence of war business were getting under way, the amount of fabricated work contracted for averaged 107,000 to 108,000 tons per month, while for the seven months preceding, those following immediately on the outbreak of the European war, the monthly average hardly exceeded 5100 tons—December, 1915, was the high month with about 208,000 tons.

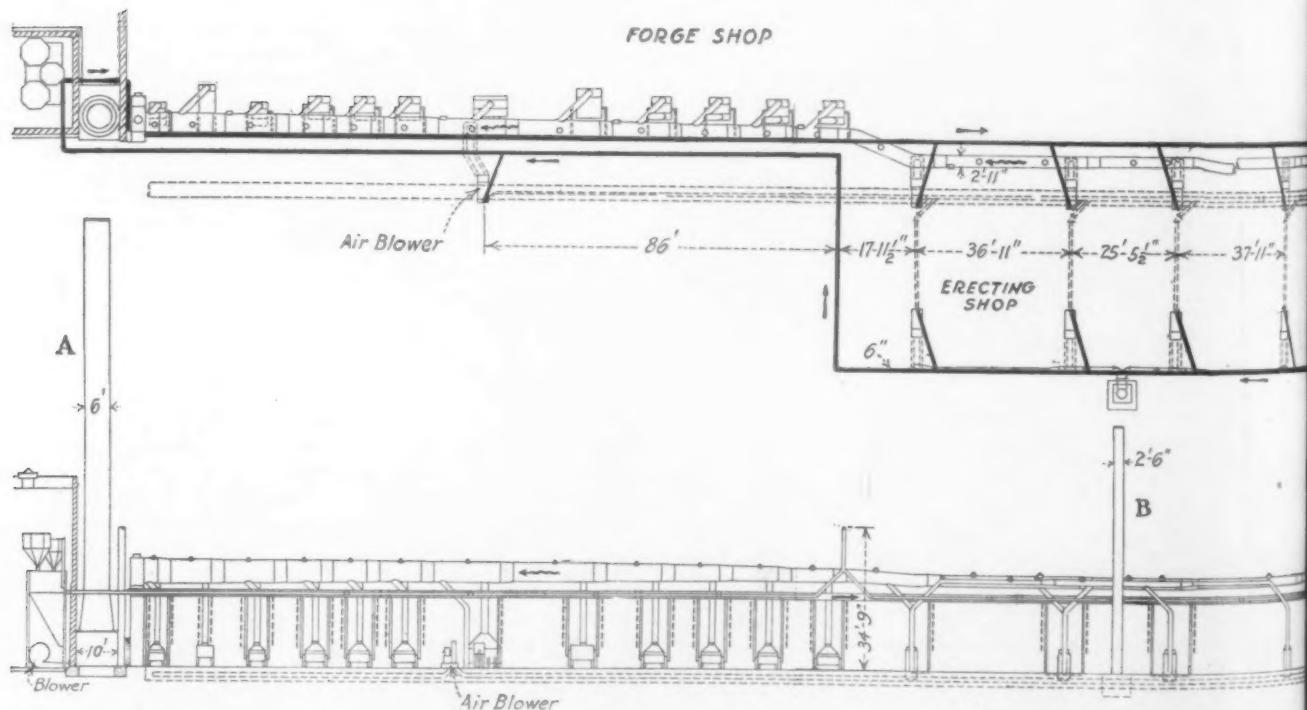


POWDERED COAL BURNING

Plant at the Works of the Standard Steel Car Company at Middletown, Pa.

A notable example of the utilization of powdered coal for drop forge and other heating furnaces is obtained in a plant which has been in operation over a year at the works of the Middletown Car Company, Middletown, Pa., which works are controlled by the Standard Steel Car Company. It is an installation of the Holbeck system, made by the Bonnot Company, Canton, Ohio, under

the direction of A. A. Holbeck, chief engineer of its powdered coal department. The powdered coal is distributed by being blown by means of an air current through a pipe, which makes a circuit around the plant, returning to the blower. There is a branch pipe to each furnace, which may be cut in and out as desired. The plan of the Middletown installation is here reproduced and the striking feature is that the powdered coal distributing main is 2125 ft. long. It contains thirty-seven elbows and spans a craneway five times. The general scheme of the Holbeck system is also illustrated, together with types of



The heavy black line shows the pipe line through which the coal dust is carried by an air current all around the shop and over cranes in motion. Branch pipes to the furnaces are fitted with valves and the amount of coal and air blown from the source of supply is controlled. The coal is delivered mainly through underground piping with an uptake to each burner. Sheet metal

furnaces to which it has been satisfactorily applied.

The plan drawing covers part of the pulverizing or coal preparing plant. Bituminous run of mine or slack coal is deposited in the track hopper and a reciprocating feeder feeds the coal into the hopper of a two-roll coal crusher. This delivers to a 24-in. belt conveyor, which carries the coal to the boat of a bucket elevator, and by means of this and a 12-in. spiral conveyor the coal is discharged into a 100-ton coal bunker.

The crushed or slack coal is taken, as required, from the coal bunker through a 6-in. spiral conveyor to the hopper of a Richardson automatic scale, where it is weighed in 100-lb. lots and passed on through another 6-in. conveyor to the rotary coal dryer. This coal dryer employs a steel shell revolving at the rate of 5 r.p.m. It is set at an inclination of about $\frac{3}{4}$ in. to the foot. A slow fire is maintained in the fire chamber, placed at the delivery end. The products of combustion pass up through the dryer in direct contact with the coal, thus evaporating the moisture in the coal and carrying it in suspension and up the stack.

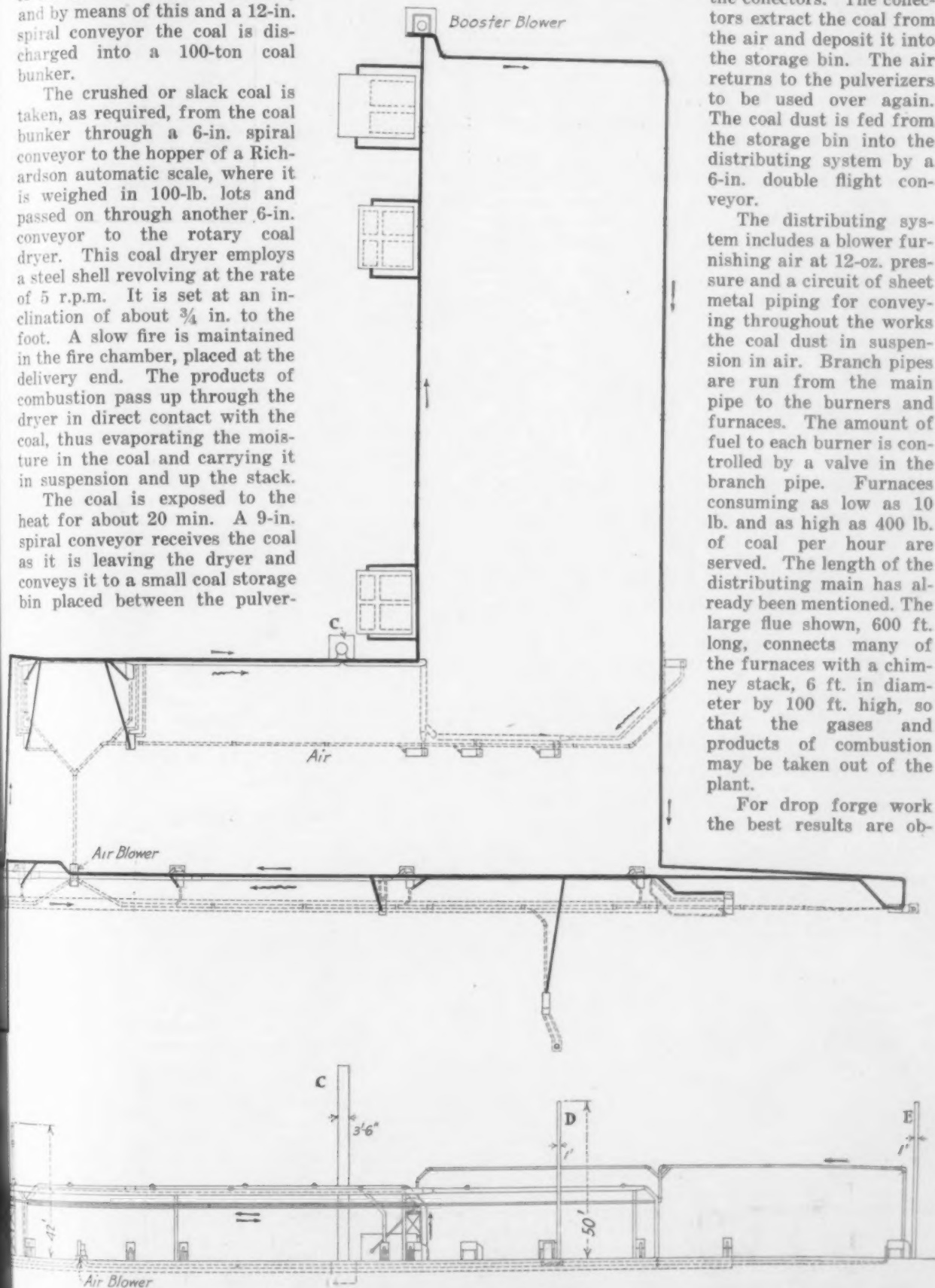
The coal is exposed to the heat for about 20 min. A 9-in. spiral conveyor receives the coal as it is leaving the dryer and conveys it to a small coal storage bin placed between the pulver-

izers. The pulverizers are equipped with vacuum separators so that it is necessary for the coal to be pulverized to a fineness where it will float in a partial vacuum before it can leave the pulverizers. The exhausters, indicated on the platform in the diagram, bring about the partial vacuum in the separators and exhaust the powdered coal from the separators and blow it into the collectors.

The collectors extract the coal from the air and deposit it into the storage bin. The air returns to the pulverizers to be used over again. The coal dust is fed from the storage bin into the distributing system by a 6-in. double flight conveyor.

The distributing system includes a blower furnishing air at 12-oz. pressure and a circuit of sheet metal piping for conveying throughout the works the coal dust in suspension in air. Branch pipes are run from the main pipe to the burners and furnaces. The amount of fuel to each burner is controlled by a valve in the branch pipe. Furnaces consuming as low as 10 lb. and as high as 400 lb. of coal per hour are served. The length of the distributing main has already been mentioned. The large flue shown, 600 ft. long, connects many of the furnaces with a chimney stack, 6 ft. in diameter by 100 ft. high, so that the gases and products of combustion may be taken out of the plant.

For drop forge work the best results are ob-



and back to the pulverized coal bin. So long is the line that a booster blower, as indicated, is employed to keep the coal dust fully controlled according to the number of branch pipes, and that is furnaces, in operation. Air to support combustion is taken care of the products of combustion, leading to chimneys, as at A, B, C, D and E.

tained by using a furnace with a combustion chamber, as shown in one of the sketches in the diagram cut. This chamber acts as a gas producer. The pulverized coal is almost instantly converted into a fixed gas and passes over the bridge wall, in the hot state, into the heating chamber where it meets additional air, thus burning and developing a high temperature. Forging heats, it is stated, are obtained inside of 20 min. from the time of starting the fire, which is started by igniting a small piece of oiled waste and placing it in the burner and turning on the coal dust.

Another type of furnace shown is the underfired furnace. In this case the combustion chamber is dispensed with and the stock introduced into the furnace from the top.

For some work, such as drawing out or heating on the end only, this style of furnace gives very good service, but where it is necessary to heat the stock all over the combustion chamber furnace, it is stated, will give the best satisfaction.

Mr. Holbeck has found that 10 lb. of pulverized coal is equivalent to 1 gal. of fuel oil. With coal at a cost of \$3 per ton pulverized, this would be equivalent to fuel oil at 1½c. per gallon. He says that 75 lb. of coal dust is equivalent to 1000 cu. ft. of natural gas, or with powdered coal at a cost of \$3 per ton the coal dust for equal conditions requires natural gas to be 11¼c. per 1000 cu. ft.

Vertical Sand Belt Machine in a Pattern Shop

Vertical sand belt machines have been used in box factories and other plants for a number of years, but very few of them in wood pattern shops. The Modern Pattern Company, Springfield, Ohio, installed one of these machines several months ago and the resultant saving effected in its use is said to be somewhat surprising.

Recently the firm completed a rush order of a pattern for a large strainer body. This pattern was in two pieces, the parting line being near the center and requiring a height of nearly 14 in. on each half. It was built up in the usual way. The cut was laid out on the parting line and the table set at the required angle to give the necessary draft to the pattern. This job was completed in 22 min., whereas if the work had been laid off on both sides it would have required from 2 to 3 hr. to complete the job. This is only one of a number of jobs that has been done on the machine since it has been in use.

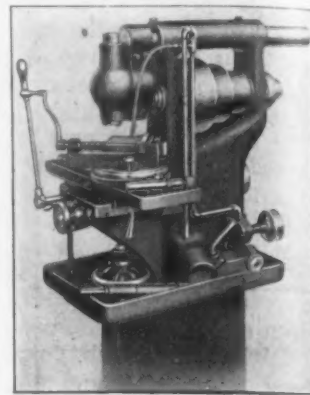
The machine was made by the J. A. Fay & Egan Company, and has a No. 2 garnet cloth belt, 14 in. wide and 10 ft. long, which gives a total cutting surface of nearly 12 sq. ft. The top sand belt platen, or pulley, is 24 in. above the table, thus giving 336 sq. in. of total cutting surface that can be utilized.

Carlsruhe Cleanser Made in United States

A preparation for cleaning metal surfaces preparatory to plating, for example, has been placed on the market by James H. Rhodes & Co., 162 William Street, New York. It consists of a combination of sodium, aluminum, silicon and oxygen in the form of a double salt which combines chemically with the grease and oil on the surface of the work to form an insoluble basic salt that is thrown out of the solution. In this way, it is explained, the surface of the metal is left chemically clean and free from the soapy mixture that sometimes remains in the hair lines and irregularities of the surface. The material, which is known as the Carlsruhe cleanser, was formerly made in Germany, but is now being manufactured in the United States. While readily soluble in water, the material is not deliquescent. The cleaner is alkaline, but not caustic nor corrosive, and another point upon which emphasis is laid is the absence of poisonous or irritating fumes from a boiling solution.

New Combined Type Milling Machine

The Bickford Machine Company, Greenfield, Mass., has recently placed a combined horizontal and vertical milling machine on the market. The machine, which is intended for the production of duplicate medium-sized parts, is of the standard horizontal type and an attachment is provided to enable vertical work to be done. In the design an effort has been made to eliminate backlash and chatter in the table feed mechanism and to do away with the possibility of the cutter marking the work at the end of the cut.



A Combined Horizontal and Vertical Milling Machine for the Production of Duplicate Parts of Medium Size

The vertical attachment has a crucible steel spindle which is driven through steel gears by a driving shaft that enters the main spindle of the machine. When the attachment is in place, it is pointed out that it becomes a part of the machine, the spindle receiving the full power of the main driving belt. This spindle runs in phosphor bronze bearings and is bored for a No. 9 Brown & Sharpe taper. The change from horizontal to vertical work, it is pointed out, is made readily as the attachment slips into place easily.

A quarter section of a screw is used as the rack for the table feed. It is driven from a worm gear, an arrangement which is relied upon to do away with practically all backlash and chatter. To return the table when the feed is stopped a weight is provided, thus preventing the cutter from marking the work at the end of the cut. A lever can be placed on an extension of the feed shaft to provide hand feed and thus enable the machine to be used as either a hand or power feed type. Lever clamping screws and adjustable graduated collars on both the elevating and cross-feed screws are provided to add to the convenience of the operator.

A geared pump attached to the rear of the machine is employed to keep the cutters from becoming overheated. The supply tank for the cooling compound used is located in the base of the machine. The swivel vise furnished is a plain vise to which a circular plate and ring have been added.

Detecting Defects in Castings by Magnets

Detecting the presence of internal defects in iron and steel castings is accomplished by a current which is supplied from a small alternator to the primary winding of an induction coil and which induces in the secondary winding a current which is passed through the coils of two horse-shoe magnets, mounted at a fixed distance apart and movable to and fro over the surface of the casting, according to a writer in *Giesserei Zeitung*. The fields of both magnets will be affected uniformly if the structure is homogeneous. Defects, however, will disturb the lines of force from the nearest magnet. In a vibrating sounder, connected to a secondary coil on the magnet, the tone produced will differ in pitch from that given out from the corresponding sounder connected to the other magnet. Amplification of sound is secured by microphone attachments enabling the observer, by means of telephone receivers, to detect the locality of hidden flaws as the magnets are moved over the casting.

As a result of labor difficulties, which it has proved impossible to adjust, the Heine Safety Boiler Company has transferred practically all of its work from St. Louis to its Philadelphia plant, while the Joseph Wangler Boiler & Sheet Iron Company has opened a plant at Litchfield, Mo., and is doing most of its work there. The John O'Brien Boiler Works has under consideration propositions to locate in other cities.

PROPOSED COPPER TAX

An Industry Singled Out for a Heavy Burden Under the Revenue Act

WASHINGTON, D. C., July 18, 1916.—The omnibus revenue bill, passed by the House July 10, and referred to the Senate Finance Committee, is in the hands of three subcommittees and every effort is being made to report it to the Senate before the end of next week in order that it may be passed and signed by the President in time to take effect on or before Aug. 1.

PROTEST OF COPPER INDUSTRY

The chief contest has been waged concerning the provision of the munitions tax section requiring those engaged in the smelting, refining or alloying of copper to pay taxes ranging from 1 per cent of their receipts in excess of \$25,000 and not exceeding \$1,000,000 up to 3 per cent of the amount by which their receipts exceed \$10,000,000. Senator Stone's subcommittee has been appealed to by the Montana and Michigan Senators to strike out this provision of the revenue bill and mine owners, smelters and refiners throughout the industry have sent to Washington large numbers of urgent protests against the proposed legislation. The effect of the tax on the industry and the reasons for opposing it are thus set forth in a statement made by Representative Hayden, of Arizona, which has been placed before the Finance Committee:

It is true that the bulk of this tax will be collected from the refiners and alloyers of copper, but I trust that no one will insist that the revenue thus obtained will actually come out of the pockets of those who "manufacture" copper, as the bill describes it. The refiners and alloyers cannot pass the burden on to the consumers by adding the tax to the price of their products, because refined copper and brass are sold in a world market, where the price is regulated by supply and demand. But the refiner can, and will, recoup himself by either increasing the refining charges or by reducing the price paid for unrefined copper. Therefore, this is a tax upon production that must ultimately be paid by those who mine copper ores.

This tax dates back to Jan. 1, 1916, and the amount due for this calendar year must be paid on or before April 1, 1917. The United States Geological Survey recently estimated that at the present rate of production over 600,000,000 lb. of copper will be produced in Arizona in 1916. This is nearly twice the output of any other State, and represents over one-third of the copper produced in the United States. Six hundred million pounds of copper, at an average price of 25c. a pound equals gross receipts aggregating \$150,000,000 that will be subjected to taxation. The maximum tax under this bill is 3 per cent, but presuming that advantage is taken of that other provision of the bill which allows a net profit of 10 per cent on the amount actually invested in the "manufacture" of copper, still it is safe to assume that this tax will yield a return of 2 per cent on the gross output. In that event, at least \$3,000,000 will be collected from the copper produced in my State.

Now, those who mine copper in Arizona are as patriotic as any other body of Americans. They are willing to pay a fair share of the cost of preparedness, but they do object to having copper singled out for double taxation while no such discrimination is practised against any other metallurgical industry. As a matter of fact, this bill provides for triple taxation of large quantities of copper. First, the refiner must pay a tax on the gross receipts of his business. Then the alloyer, who purchases the refined copper that has once been the basis of a tax, is taxed on his gross receipts. The alloyer sells brass to a munition maker, who must pay a tax on the gross amount he receives for the cartridges and other war material he has sold. A pound of copper that follows this course will, in all probability, be used as a basis for at least a 2 per cent tax paid by the refiner, another 2 per cent tax paid the alloyer, and still another tax of at least 4 per cent paid by the munition manufacturer. I am sure that the Committee on Ways and Means could not have given much study to the effect of this double and triple taxation of copper or certainly they would not have included this form of raising revenue in the bill.

WHY COPPER AND NOT OTHER METALS?

Mr. Hayden admits that the producers of copper are now enjoying great prosperity, but declares that they have justly earned this reward by passing through a

period of depression as the result of embargoes and unfriendly legislation like the English orders in council declaring copper to be contraband. Continuing, Mr. Hayden says:

I would like to inquire why copper has been taxed in this bill and no tax has been placed upon steel? If copper is to be taxed because it enters into the manufacture of munitions, why has not steel been taxed for a similar reason? Steel is used to make cannon and shells, small arms and machine guns, railroads and bridges, and every other war use from barbed wire to battleships. Yet there is no tax on steel ingots or billets in this bill. If there is to be double taxation of copper because it is used in making munitions, why should not steel also be twice taxed? Everyone knows that vastly more steel and iron is used in modern warfare than any other single metal.

In addition to copper and iron all of the other metals have advanced in price owing to the demand created by the European war. Lead and antimony are used to make bullets and shrapnel. Aluminum is required for aeroplanes, Zeppelins and automobiles. The manufacture of projectiles and armor plate makes a market for nickel, and quicksilver is used to make priming explosives. A vast quantity of zinc is consumed in the form of brass and to galvanize barbed wire. If copper is to be taxed, why ignore these metals? There is no double taxation on any of these articles in this bill.

On behalf of the Ways and Means Committee an unofficial statement has been made by one of its members as to the basis of the copper tax and in explanation of the apparent discrimination against that metal in favor of iron and steel, lead, etc. The investigations of the committee convinced its members that practically all the lead employed in the manufacture of munitions would be taxed under section 201 of the proposed act at rates ranging from 2 to 5 per cent and that manufacturers of iron and steel employed as war material would pay similar rates. The fact that copper is used in connection with other materials in the manufacture of munitions rendered it difficult, in the opinion of the committee, to impose a tax that would rest where it was desired or that would fall upon the large quantity of copper exported in an unmanufactured condition for the production of munitions abroad. It was, therefore, decided to levy the tax on the entire industry but at a rate only about one-half as great as that assessed upon other munitions, upon the assumption that about 50 per cent of the production of copper during the calendar year 1916 will be consumed in the manufacture of war material.

This statement is far from convincing to those interested in the production of copper, but it is quite as logical as the contentions of the Ways and Means Committee with respect to certain other features of the bill, notably, the anti-dumping clause and the system of tariff duties for the dyestuff industry which proposes to develop a new business in this country by imposing rates of duty asserted by the most experienced manufacturers in the industry to be wholly inadequate and which the bill stipulates shall be reduced 20 per cent per annum until, in the short period of five years, they are entirely wiped out.

W. L. C.

A Chicago association has had printed in pamphlet form an exhaustive list of surplus and inactive stocks of a wide variety of materials, including iron, steel, brass, copper, and other metals held by manufacturers in and about Chicago. The pamphlet also includes a corresponding list of supplies for which there is inquiry in the market. Copies of this pamphlet can be had from the Civic Industrial Committee of the Chicago Association of Commerce, 10 South LaSalle Street, by whom it was published.

The Decatur Malleable Iron Company, Decatur, Ill., expects to have its malleable plant in operation by Aug. 1. A. W. Wagner, formerly president and general manager of the Terre Haute Malleable & Mfg. Company, Terre Haute, Ind., is president; Donald E. Willard, formerly treasurer and engineer of the Allith-Prouty Company, Danville, Ill., is vice-president, and Irving A. Sibley, Jr., formerly secretary and general sales manager of the Allith-Prouty Company, is secretary-treasurer.

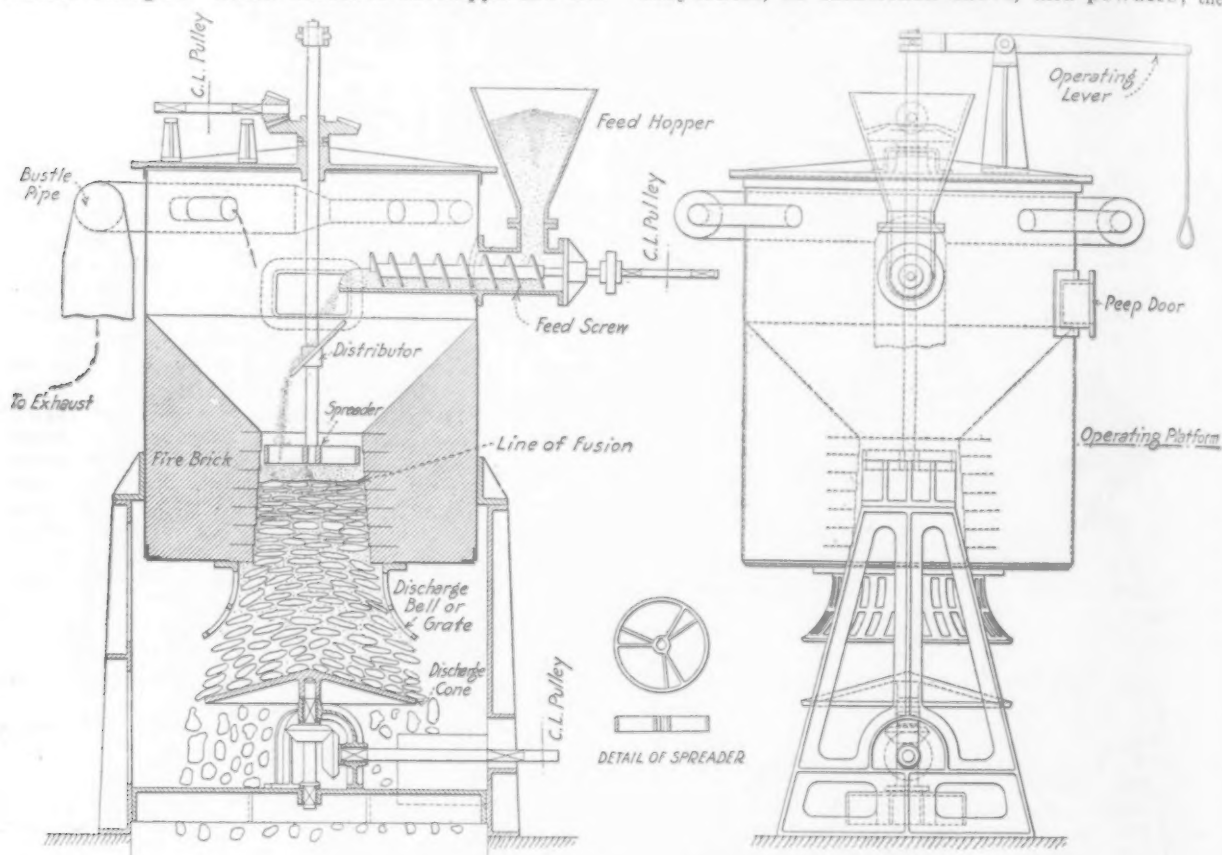
A Continuous Ore Sintering Machine*

Protection of All Parts Subjected to Heat a Feature—Advantage of the Flaring Tube—Use of a Spreader as a Ram

BY P. O. HARDING

THE Harding continuous sintering machine was especially designed to treat iron ores, and is the product of a study to avoid the burning and the clogging of the grate, which occur with some sintering methods, and to overcome the operating difficulties and the expense of igniting successive charges. Other features developed are the

bustion above dehydrates it, and where the hot masses of clinker come in contact insulation is broken down very rapidly, resulting in a burned grate. To effect a screening action of the air, preventing the fine ore from being drawn through the grate, finely broken limestone is used. This readily dehydrates, as mentioned above, and powders; the



Details of the Harding Continuous Ore Sintering Machine

tapering tube and the protection of all parts subjected to heat.

From the illustration it will be noted that the machine is screw fed. The mixture falls to the distributor and is in turn further distributed by the spreader and pusher. Air is drawn up through the tube to the bustle pipe by an exhaustor. The clinkered material descends and is discharged by the extractor to waiting cars or storage pit below.

The burning of grates in the down-draft machines is caused by the line fusion progressing in waves. This may be caused by poor mixing or segregation afterwards, and by uneven moisture content of the mixture. When the peak of such a wave reaches the grate, the operator has his choice of a burned grate or dumping the charge before the mass is entirely sintered. He generally decides on part of both. It is the general practice to protect the grate by a layer of limestone.

Unfortunately this method acts as a barrier for only a short time. The heated gases from the com-

grate in this way becomes clogged. In large sintering pans it is customary to "dig out" the grates after each charge and to place bricks or large chunks of sintered ore over the burned spots. This is continued until the grate is burned in a sufficient number of spots to cut the effective area to a point requiring replacement.

As to the ignition, this is continuous in this machine after the operation is once started. No oil is used and the burner difficulties are obviated. The cost of oil and the expensive equipment of handling it are thus saved.

The flaring tube not only facilitates the downward passage of the clinkered material, but opens up channels for the passage of air. The clinkered ore is scoured of its dust and small globules of unfused ore are thus swept back to the zone of fusion. This is important, since experience on unsintered sintered ore in one instance yielded 5 per cent flue dust at the blast furnaces, the untreated ore only 2.95 per cent.

The pan equipment of the down-draft process is subjected to wide variations of temperature. This is extreme, as the volatile content of the flue dust is

*Mr. Harding, the inventor of this machine, is now in South America, working on the smelter problems of the Braden Copper Company. Christy & Christy, Farmers Bank Bldg., Pittsburgh, Pa., have been appointed his agents.

carbon. This, together with the fact that one of the favorite methods of cleaning the grate is by violent hammering, causes the pans to crack. This is applicable to the small pans. The grates of the larger units are "dug out," as mentioned, but contraction and expansion difficulties of the pans have been encountered that have not successfully been met.

In this machine the fire body is enclosed by fire-brick. After the discharge bell and cone reach their working temperature, this is maintained. They are circular, and therefore admit expansion with minimum internal stresses. The spreader is bathed in the green entering mixture. If the line of fusion should become uneven and burning through the mixture necessary, the spreader can be raised. One feature not to be forgotten is the use of the spreader as a ram when the tube becomes skulled or the clinkered material arches.

While thorough mixing of the ore and flue dust are essential for the best operation of the machine, this need not be carried to an extreme, as is necessary with the down-draft equipment. However, a batch concrete mixer is recommended. The flue dust addition to the ore varies, but 20 per cent of the 25 per cent carbon content dust has been found to give good sinter. The dust, however, can be increased, but care must be taken to keep the dilution to a point that excessive skulling does not occur. Sufficient water should be added in the mixing to make the ore take the shape of the hand when squeezed. The diameter of the tube should be 6 ft., height of column 3 ft., and estimated output 125 tons of sintered ore per day.

Desulphurization in the Blast Furnace

Desulphurization in the blast furnace proceeds as follows, according to an article by B. Ossann in *Stahl und Eisen*, which has been abstracted by the London *Ironmonger*:

In the final stages of the reduction process, mixed crystals of iron and slag are present, with nearly all the sulphur combined with iron as iron sulphide, because of the great affinity of these two elements. Only when all the ferrous oxide has been eliminated by reduction does desulphurization begin, the reducing atmosphere leading to the deposition of carbon on the crystals and to a reaction in which iron sulphide is reduced to metal, the sulphur combining with the lime and manganese, and the carbon transformed into CO. The more manganese present, the more is desulphurization promoted. An excess of lime raises the fusing temperature of the slag, and as a thoroughly fluid slag is essential, the reaction temperature must be raised by using a large coke charge and a very hot blast, the coke retarding the working of the furnace and thus affording the necessary time for desulphurization. An excessive amount of lime is unfavorable, and it is significant that in making ferrosilicon, where slags of low basicity are produced, no difficulty is ever experienced from sulphur. A large slag proportion is beneficial, and so it is possible to convert minette ore, rich in sulphur, into basic pig low in that element.

Supplies of silica brick in Great Britain are so inadequate for renewing and maintaining the open-hearth steel furnaces of the country that the government has prohibited their exportation. As a result, Sweden is feeling the pinch, for considerable quantities on the way to Sweden have been stopped at the port of shipment. As Sweden depends on Great Britain for most of its supplies of these brick, her steelmakers are appealing to England to relax the restrictions, fearing that many of their steel plants will soon have to close. These appeals have been refused, but it is hoped that the British silica brick output can be increased soon. The great drawback is a shortage of labor.

BUFFALO-NIAGARA INDUSTRIES

New Industrial Development in Niagara River District Involving \$10,000,000

The Niagara frontier has shown a remarkable degree of industrial expansion during the past year. Many new industries have been established and existing plants enlarged along the Niagara River, between Buffalo and Tonawanda and at Niagara Falls and in the city of Buffalo. The total outlay is estimated at over \$20,000,000.

A considerable portion of the new development along Niagara River, just north of Buffalo, is attributable to the establishment on the river front, near the Grand Island Ferry, of the steam-generated electric power plant of the Buffalo General Electric Company, which will have an ultimate capacity of no less than 200,000 hp. This power station is to supplement the power developed at Niagara Falls. The first section of this power plant, which will generate 80,000 hp., will be completed this fall. The initial equipment will comprise two 20,000 and one 30,000 kw. Curtiss steam turbo-generators. The construction and equipment of the plant complete will involve the expenditure of \$3,000,000.

The Wickwire Steel Company is at present engaged in making additions to its plant on the Niagara River, one-half mile north of the new power plant. This new construction, involving \$3,000,000, includes three 60-ton open-hearth furnaces, with necessary gas producers and one 500-ton metal mixer; a blooming mill, a rod mill, a wire mill for the production of all sizes of wire, a galvanizing department, a tinning and copperas plant, a wire nail mill, a keg-making factory, a barbed wire mill, additional entrance buildings and workmen's houses, etc. New boilers of 3000-hp. rating, besides equipment for developing 3000 hp. not heretofore utilized, are included. The company has also contracted for 3000 hp. electric power from the Buffalo General Electric Company.

The Semet-Solvay Company, which has recently purchased a site of 50 acres on the River Road, adjoining the Wickwire Steel Company, is constructing 60 by-product coke ovens at a cost of about \$2,000,000. The plant will produce 750 to 800 tons of coke (furnace and foundry), besides gas, ammonia, tar and benzol. All of the gas and all of the furnace coke (about 650 tons daily) are to be used by the Wickwire Steel Company.

The Acheson Graphite Company, Niagara Falls, is about to build a large branch plant, to be known as Plant No. 3, costing \$500,000, to be erected on a site just purchased adjoining the Buffalo General Electric power plant on the Niagara River.

The New York Graphite Mfg. Company, New York, has also bought 20 acres of land on the River Road, near the new Electric power plant, and will construct a large plant.

EXPANSION AT NIAGARA FALLS

The Hooker Electro-Chemical Company, Niagara Falls, is this summer completing extensive additions which double its capacity and involve about \$1,000,000.

The Niagara Alkali Company has let the contract for additions to its plant at Buffalo Avenue and Union Street, to cost \$750,000, and the Electro-Bleaching Gas Company, an auxiliary, or allied, company, is doubling its capacity.

The Aluminum Company of America has contracted for the erection of a six-story addition on Buffalo Avenue and Nineteenth Street, to cost \$100,000, and Wm. A. Rogers, Ltd., has under way a \$100,000 addition to its factory for the manufacture of silverware, at Main Street and the Hydraulic Forebay.

The Niagara Electro-Chemical Company, Buffalo Avenue and Adams Street, has contracted for a three-story addition, 50 x 172 ft.; and the Star Electric Company, formerly the Electrode Company of America, has completed a 100 x 500-ft. addition.

The Castner Electrolytic Alkali Company has just completed an addition to be known as Plant No. 8.

Bids are being taken for a large addition to the Titanium Alloy Mfg. Company's plant. The Isco Chemical Company, recently incorporated, is building a plant at Union Street and Royal Avenue for the manufacture of caustic soda and bleach. Six buildings will be erected, to cost \$300,000. The Hydol Company, recently organized, is building an oil plant at Buffalo Avenue and Union Street.

Another new industry recently established at Niagara Falls, the Niagara Smelting Company, has in course of construction a plant of 15 buildings, to cost about \$750,000.

The Du Pont De Nemours Powder Company has completed its new plant of eight buildings at Niagara River and the Niagara Junction Railroad. This plant is to make artificial leather and products involving the use of chlorinating gas, which will be supplied by the Hooker Electro-Chemical Company.

Large additions have recently been made to the Oxolite wheel plant of the Carborundum Company, Niagara Falls, consisting of a three-story building, and further additions are under way. Included are the grinding building and kiln and puddle buildings, to cost \$150,000. The company recently organized the Canadian Oxolite Company, Ltd., as its Canadian branch, with a capital stock of \$100,000. A plant using 7000 hp. is being established on a site of eight acres recently acquired from the Canadian Niagara Falls Power Company at Stamford, near Niagara Falls, Ont.

The Norton Company, manufacturer of abrasives, has established at Chippewa, near Niagara Falls, Ont., a Canadian branch plant, which will be about three times the size of its plant on the New York State side of the Falls. The product will be shipped in bulk to the company's main works at Worcester, Mass. The company is also building at the Canadian plant a village of homes for its employees.

IN VICINITY OF BUFFALO

Just north of Buffalo, in the Riverside section, J. H. Williams & Co., manufacturers of drop forgings, are adding three large buildings to their plant and have plans completed for seven additional buildings to be put up later. The Beaver Company, manufacturer of Beaver board, has plans out for further extensions in this section.

Within the city of Buffalo the Buffalo Copper & Brass Rolling Mill has completed additions covering 10 acres and costing \$1,000,000, and has purchased 45 acres more for further extensions. This company now employs 4300 men.

The Donner Steel Company is building at its blast-furnace and billet-mill plant additions comprising ore dock, bar and finishing mills and by-product coke oven plant, to cost several million dollars.

The Schoellkopf Aniline & Chemical Works is constructing additions to cost \$1,000,000, and the Contact Process Company and the Buffalo Potash & Cement Corporation are each erecting large plant additions, and many other Buffalo industries are making large additions to productive capacity.

The Cloverleaf Milling Company has erected a 13-story elevator at its feed-mill plant in the Riverside section, and Buffalo has added four other huge grain elevators of modern type to its grain handling facilities.

The British Shell Output

The British weekly output of heavy shells by firms which up to a year ago had not engaged in munition work was reported recently by Dr. Addison, parliamentary secretary of the Ministry of Munitions, to be 16 times as many as were being turned out a year ago by all the large armament firms and Woolwich Arsenal combined. The latter, of course, have undergone vast extensions in the year. Another authority states that Great Britain stands better to-day in stocks of ammunition, machine guns, heavy guns of the highest standard and shells of the highest caliber than ever before. This has all been accomplished largely by the introduction of women and other new workers and the removal of trade union restrictions.

Manganese Ore from Brazil

Manganese ore exports from Brazil in the last three years, and their destination, are given as follows by U. S. Consul Alfred L. M. Gottschalk, Rio de Janeiro. The figures are, in metric tons:

Exported to	1913	1914	1915
United States	39,400	87,630	266,871
Great Britain	16,800	23,500	10,100
Germany	5,000	.....	.....
Belgium	11,800	10,600	.....
France .....	.....	11,400	.....
Total exported	122,300	133,630	288,671
Valuation	\$880,572	\$1,380,453	\$2,632,427

It will be seen that each year has shown an increase of 50 per cent in the total exports. In 1915 the United States took over 92 per cent of the total exports, Great Britain's share being only 10,100 tons. From the valuations given, the price per ton has risen from \$7.20 and \$7.50, in 1913 and 1914, to \$9.10 per ton in 1915.

The report also states that since the establishment of the Steel Corporation's United States and Brazil Steamship Line, trade in manganese ore has increased greatly. The line seems not only to have solved the problem of securing return cargoes, which in past years had been the difficulty of all shipping ventures between the United States and this coast, but it has built a substantial trade for the Brazilian State of Minas Geraes, and furnished much freight to the government-owned Central Railway of Brazil.

Swedish Steel Industry in 1916

Sweden's production of pig iron and puddled iron and of steel ingots in the first quarter of this year was 381,200 tons, against 325,600 tons to April 1, 1915, and 359,300 tons to April 1, 1914. The pig-iron output was 197,600 tons, against 162,300 and 186,100 tons to April 1, 1914 and 1913 respectively. There were 97 blast furnaces in operation (104 in 1915); 151 puddling furnaces (160); 12 Bessemer converters (12) and 57 open-hearth furnaces (63).

Exports of iron ore to April 1, 1916, were 772,000 tons, against 711,000 and 934,000 tons in the same periods in 1915 and 1914 respectively. Pig-iron exports were 45,200 tons in the first quarter of this year, against 43,300 tons to April 1, 1915, and 19,600 tons to April 1, 1914. Iron and steel exports, including ferro-silicon and spiegeleisen, were 69,400 tons to April 1, 1916, as compared with 48,500 tons and 54,600 tons for the same periods in 1915 and 1914 respectively.

Electric Furnace with Rotating Hearth

An electric steel furnace, the crucible or hearth of which is made rotatable, is the feature of an invention of Peter Eyermann, a citizen of the United States, living at Witkowitz, Austria. It is covered by U. S. patent 1,189,356, July 4, 1916. The furnace is of the arc type, the electrodes passing through the roof, but the crucible and roof are so arranged that one is rotatable relative to the other, so as to permit the current from the electrodes to act on different portions of the hearth during the operation of the furnace. The furnace may be tilted.

The twenty-second annual convention of the National Hardware Association of the United States will be held at Atlantic City, Oct. 17 to 20, 1916, inclusive. The sessions will be held at the Marlborough-Blenheim Hotel and the convention of the American Hardware Manufacturers Association will be held at the same time and place, as is the custom. On account of the establishment of the automobile accessories branch, the convention this year will be four days instead of three and the opening day will be devoted to a meeting of this new branch. The general convention will open on Oct. 18, and a meeting of the metal branch will be held on the afternoon of the following day.

The Susquehanna Iron Company's Union Street mill at Columbia, Pa., recently leased by the A. M. Byers Company, Inc., Pittsburgh, has been put in operation after an idleness of about six years.

NEW SHEET ASSOCIATION

Sheet and Tin Plate Manufacturers Organize to Make Contracts Strictly Binding

After several years of effort, a new association, embracing about 90 per cent of all the manufacturers of black and galvanized sheets and tin plate, has been organized. It will be known as the National Association of Sheet and Tin Plate Manufacturers. The initial meeting for organization and other purposes was held in the William Penn Hotel, Pittsburgh, on Tuesday, July 18, and was attended by about 30 of the leading makers of sheets and tin plate in the United States. W. S. Horner of W. S. Horner & Co., Ltd., Oliver Building, Pittsburgh, who is also vice-president of the American Rolling Mill Company, Middletown, Ohio, was elected president. James B. Andrews, Andrews Steel Company, Newport, Ky., was elected vice-president. The positions of secretary and treasurer have not yet been filled. The executive committee consists of W. S. Horner, chairman; Ed Langenbaugh, Berger Mfg. Company, Canton, Ohio; W. A. Thomas, Brier Hill Steel Company, Youngstown, Ohio; John O. Pew, Youngstown Iron & Steel Company, Youngstown; G. H. Jones, Inland Steel Company, Chicago, and W. H. Abbott, Wheeling Corrugating Company, Wheeling, W. Va. The new organization will absorb the association of sheet and tin plate manufacturers which has existed for several years largely for statistical purposes, and of which B. E. V. Luty, Pittsburgh, was commissioner. The purposes of the new organization are set forth by the association in part as follows:

To preserve the standards of quality of sheet and kindred products as manufactured by the members and to make uniform changes in such fixed standards of quality from time to time as may best meet the demands of the trade. To place this, one of the most important industries in the United States, on such a broad and sound basis that its business as a whole must necessarily be transacted within the limits of the highest standards known to the business world.

To preserve friendly relations between producers and insure such co-operation as will effect uniformity of goods in quality, sizes and finish; to secure the benefit of a free discussion on cost systems with the view to lowering the cost of production; to bring out into the open full and free discussion of trade conditions, volume of trade and the needs of the trade; and generally to develop, for the benefit of all concerned, sound commercial conditions throughout the country, in the hope that the possession of accurate information with respect to the conduct of the business and actual trade conditions will benefit the industry, the trade and the public.

For the consideration of matters relating to welfare work, safety first problems, wages, hours of labor, profit sharing and bonus plans; and generally, all questions affecting the industry in its relation to labor, capital and the public.

It shall be thoroughly understood by members of the association that all information reported to the association or distributed by it, is purely statistical, and pertains only to past and closed transactions; and that no part of the machinery of this association will be permitted to be used to fix prices for the sale of goods, or to divide the territory, or to limit the production or manufacture, or limit or control competition; and no information shall be collected or distributed respecting any prices which any member intends or expects to ask.

At the meeting held in Pittsburgh, the appended resolution was unanimously adopted. The headquarters of the association will be in the Oliver Building, Pittsburgh, rooms 420 and 421 having already been secured.

WHEREAS, one of the greatest evils, and most disturbing and hurtful to trade in general, is that of guaranteeing contract prices against market decline; and,

WHEREAS, the manufacturers of sheet and tin plate during the last four or five years, through association and otherwise, have been conducting a campaign of education against this evil; and,

WHEREAS, with the view to correcting this wrong, the American Iron & Steel Institute, through its contract committee, after several years of consideration and effort, is about to submit and recommend for the adoption by manufacturers in all lines of iron and steel industry, a new form of contract, binding both parties mutually, in which the price guarantee feature and other unsound and unfair provisions are eliminated.

NOW, THEREFORE, BE IT RESOLVED, that we hereby recommend the adoption and enforcement of such a contract, or a

similar one, embodying its cardinal principles, and furthermore recommend that from this date, binding contracts only be negotiated and concluded in which there shall be no provisions or conditions guaranteeing prices against market decline, or inconsistent with the spirit and purpose of the contract as recommended; also,

BE IT RESOLVED, that manufacturers at once send a copy of this resolution to all of their contract customers, indicating to them their purpose in connection therewith; copy of said letter to be sent to the president of this association.

The members of the new association are as follows: Inland Steel Company, Allegheny Steel Company, American Rolling Mill Company, Apollo Steel Company, Brier Hill Steel Company, Canton Sheet Steel Company, Car-nahan Sheet & Tin Plate Company, Trumbull Steel Company, De Forest Sheet & Tin Plate Company, La Belle Iron Works, Newport Rolling Mill Company, Parkers-burg Iron & Steel Company, Reeves Mfg. Company, Seneca Iron & Steel Company, Whitaker-Glessner Company, Portsmouth Steel Company, Wheeling Corru-gating Company, Youngstown Iron & Steel Company, Youngstown Sheet & Tube Company, Mansfield Sheet & Tin Plate Company, Western Reserve Steel Company, Alan Wood Iron & Steel Company, Stark Rolling Mill Company and Berger Mfg. Company.

Rail Exports Still at a High Rate

Rail exports from the United States were at the greatest rate on record in the first five months of this year. The following table is from government data:

Rail Exports from the United States, Gross Tons		Per Month
January, 1916.....	38,122	38,594
February, 1916.....	34,630	
March, 1916.....	49,034	
April, 1916.....	22,346	
May, 1916.....	48,841	
11 months ended May 31, 1915.....	122,040	11,094
11 months ended May 31, 1916.....	492,038	44,730
Year 1915.....	391,491	32,624
Year 1914.....	174,680	14,556
Year 1913.....	460,553	38,379

The five months' average of 38,594 tons this year compares closely with 38,379 tons per month in 1913, the record year. For the eleven months ended May 31, 1916, the average was 44,730 tons per month. Of the total exports of 443,197 tons for the ten months ended April 30, 1916, Russia took 262,772 tons, or over 50 per cent, while the West Indies and Bermuda received 44,696 tons, and 57,729 tons went to various countries.

Rail imports in May were 9196 gross tons, but less than 500 tons for each of the preceding four months. In 1915 they were 78,525 tons, and 10,408 tons in 1913.

Great Britain's exports of rails for the five months ended May 31, 1916, were only 25,035 gross tons, or 5007 tons per month.

German Steel Prices Go Up Sharply

The German Steel Works Union at its regular meeting May 4, 1916, raised the quotation on semi-finished steel and shapes 20 marks per ton each, bringing them to the highest prices for the war period. No similar advance has been known to take place in peace times. The following table shows the various steps in the advance in quotations during the war:

	Ingots. Marks per Ton	Billets. Marks per Ton	Plates. Marks per Ton	Shapes. Marks per Ton
At beginning of war..	82.50	87.50	97.50	110
Third quarter, 1914..	90.00	95.00	105.00	110
Second quarter, 1915..	97.50	102.50	112.50	120
Third quarter, 1915..	102.50	107.50	117.50	130
Second quarter, 1916..	107.50	112.50	127.50	140
Third quarter, 1916..	127.50	132.50	147.50	160

The last increase is due, says a report of the meeting, to the constant increase in the cost of manufacture.

It is further stated that the Prussian State Railways have placed final orders for material for 1916 which fall short of those for 1915. Some extensive sales at favorable prices have been made to neutral countries. There is very little demand for structural material for ordinary building purposes, but a good demand from engineering and car works. The increased prices are a source of dissatisfaction to consumers as profits are known to have been large lately.

ESTABLISHED 1855

THE IRON AGE

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A Delusive Anti-Dumping Measure

The anti-dumping section of the omnibus revenue bill passed by the House at Washington last week, if finally enacted in its present shape, will probably prove wholly ineffective. To prevent or punish dumping it will be necessary under its terms for the complainant to prove affirmatively that it has been "commonly and systematically" resorted to "with the intent of destroying or injuring an industry in the United States or preventing the establishment of an industry in the United States, or of restraining or monopolizing any part of trade and commerce in such articles in the United States."

It is a well-known fact that only in rare instances is dumping "commonly and systematically" pursued, and that in the nature of things it cannot be. A familiar illustration is the sale at less than the usual price in a country foreign to the producer, of a surplus quantity of his product, which for various trade reasons may have accumulated on his hands, or which under peculiar conditions he may have turned out for the purpose of reducing his unit of cost. No manufacturer who "commonly and systematically" sold any considerable proportion of his output below cost could survive long enough to make a recognized record of his system.

The condition of the proviso that any act to be illegal must be done with the intent of destroying or injuring an industry of the United States immediately erects an impassable barrier against the prosecution of the offender. To prove such intent on the part of the foreign manufacturer, from whom alone the evidence can come—for there is nothing in the proposed law providing a presumption of guilt or transferring the burden of proof to the producer—would be an utter impossibility.

The dumping provision of the bill stipulates that a sale to be illegal must be made "within the United States." Such a statute might prohibit the American agent of a foreign manufacturer from importing and selling in this country undervalued merchandise, but it certainly could not be invoked to prevent an American consumer from going, or sending an agent, to Germany to buy German goods at any price the manufacturer might be willing to take and ship them to the United States invoiced at the price actually paid therefor. Under the general customs laws in force for many years the Government might advance the invoice value of such

an importation and require the importer to pay duty on the increased valuation, but this would not deprive the American consumer of the big advantage secured in the low cost price. Upon the whole, it is quite obvious that the Kitchin anti-dumping clause is a delusion and a snare.

Notes on Steel Production

The publication last week of the 1915 statistics of production of steel ingots and castings as well as of most finished iron and steel products prompts a discussion of the details. Some general deductions as to the relations between the production of ingots and finished steel were given in this department a week ago, the difference between ingot and rolled steel production being unusually large and reflecting the heavy discards involved in the manufacture of shell steel.

A comparison of the Steel Corporation's production with that of the total is always interesting. The corporation's proportionate production has a way of decreasing in "off" years, hence comparison of 1915 figures may well be made with those of 1913, the years having been in substantially the same category as to total tonnage. The Steel Corporation's proportion of the total pig iron increased from 45.47 per cent in 1913 to 45.60 per cent in 1915; in other words the proportion was practically unchanged. The proportion of steel ingots produced (excluding steel castings) decreased from 54.96 per cent to 52.35 per cent, quite a material decline. The Minnesota steel plant contributes to production this year. With the additional duplexing plants at the South Works and the Gary plant, together with the Bessemer plant at Gary and various smaller additions elsewhere, the corporation may easily in future reach as high a proportion as in any recent year. Its proportion of the rail tonnage decreased from 55.51 per cent in 1913 to 51.26 per cent in 1915.

There was a remarkable decrease in the country's production of rolled iron in 1915. While the rolled steel output was the same as in 1913, within 15,000 tons, the rolled iron production decreased from 1,678,257 tons in 1913 to 1,294,833 tons in 1915, or 22.8 per cent. Barring the decidedly "off" years 1914 and 1908, the rolled iron production in 1915 was the smallest since the gathering of statistics of rolled iron was resumed in 1904. The largest

production in the past 12 years was 2,200,086 tons, in 1907. There has been a particularly heavy decrease in the production of bar iron.

Comparing 1913 and 1915, with substantially the same total of rolled iron and steel production, the following percentage changes occurred in individual products:

	Per cent
Rails	-27.4
Rods	+25.7
Skelp, etc.	- 8.0
Shapes	-18.9
Plates	- 6.8
Merchant bars ..	+ 4.5
Sheets and black plate	+21.8

These changes were signs of the times. There was relatively little structural work or car building, reflected by the decline in structural shape production, but not by any material decrease in plate production because there was a heavy demand for ship plates. The very large gain in wire rod production was due to heavy export demand for both rods and wire products, particularly barb wire. In a year of light construction work generally, there was naturally a decline in rail production. The increase in the production of sheets, including black plates for tinning, is somewhat remarkable, but those lines are a law to themselves. The sheet production in 1913 was light, much below that of 1912, although on the whole 1913 was the better year for iron and steel production. Tinplate production in 1915 was exceptionally heavy, due to large demand both domestic and export, and a new production record was made by about 12 per cent.

It is instructive to observe that two lines for which much had been expected, railroad ties and rolled sheet piling, have not been tonnage producers as expected. Neither line has yet shown an output of even 50,000 tons in a year.

While the production of wire rods in 1915 was abnormally large and not representative of what may be expected in a normal year in future, it is interesting to compare the production with that of other commodities. In 1906 and a number of preceding years the production of rods was about one-half that of rails. In 1915 the rod production exceeded the rail production by 40 per cent. In 1906, 1910, 1912 and 1913 the production of rods was less than that of shapes, but in 1915 it was 27 per cent in excess. It is one of the interesting things in steel statistics that the light products, such as wire, sheets and tin plates, have become such tonnage producers.

A New Pace in Steel Exports

Iron and steel exports in May broke the previous record for a month by 23 or 24 per cent, both as to the weight of the tonnage items reported and as to the value of all iron and steel reported as such. Comparing May with the average of the preceding ten months the increase in tonnage is 42 per cent and the increase in value is 54 per cent.

Inasmuch as the export market has been particularly active in the past two or three months, or since the orders were booked that resulted in these May exports, it is in order to make fresh estimates of the proportion of our steel that is going abroad.

For various reasons the most illuminating and conclusive estimate is one based upon our finished steel production, rather than upon pig-iron production. The appearance of statistics of rolled steel output in 1915 makes it possible to estimate closely the present rate of production, for it is safe to assume that the finished rolled steel production is in proportion to the pig-iron production. That was 30,000,000 tons last year while the present rate is 39,500,000 tons, and when last year's production of rolled steel was 23,098,091 tons the present rate of production is presumably about 30,400,000 tons a year.

The total weight of the tonnage exports in May was 540,591 tons. Deducting pig iron, scrap, iron castings, bar iron, etc., and allowing for the fact that some of the tonnage was unfinished steel while the wire products were more finished than the rolled steel the statistics report, the May tonnage exports may be taken to represent 5,600,000 tons a year of our rolled steel. That is 18.4 per cent of the rolled steel we are producing.

It is difficult to estimate the amount of rolled steel consumed in the production of the steel manufactures that are exported, but approximations can be made which on the whole would probably be fairly representative. It is not the weight exported that is to be estimated, of course, but the weight of the steel that is bought from the steel mill by the makers of machinery, railroad cars, automobiles, shells, etc.

In May there was machinery exported to the value of \$21,984,961. At 10 cents a pound this would represent 1,200,000 gross tons a year. There was about \$15,000,000 value in unloaded shells and about \$30,000,000 in loaded shells. Together these should represent, in steel as shipped from the mills, a rate of about a million tons a year, and the following estimates are made for certain other commodities: Agricultural implements, 50,000 tons a year; railroad cars, 200,000 tons; automobiles, 25,000 tons. The various items would total 8,075,000 tons a year, although many minor items involving steel in their manufacture are omitted. Apparently it would be quite conservative to take the total, based on the May record, at 8,000,000 tons of finished steel a year, in the form in which shipped from the mills. That would be 26.4 per cent of our present rate of steel production. Appearances are that the exports will increase rather than decrease, as compared with the pace set in May.

The decrease, present and prospective, in shell manufacture reported from so many points, does not necessarily take business away from the steel mills. England and France have been largely increasing their facilities for making shells. That is well known, and there is confirmation in the statistics showing that the May exports of metal working machinery were 130 per cent greater than the average in the ten months preceding. There could easily have been a decrease, on the basis of the foreign munition factories being already well equipped. There is in progress a transfer of shell manufacture from the United States to the allied countries. There is correspondingly more rolled steel required from the United States. While the total tonnage exports in May were 42 per cent greater than the average of the ten months preceding, the exports

of billets, blooms, etc., increased 103 per cent, while the exports of steel bars increased 63 per cent. Not all the unfinished steel, of course, is of shell quality, but when more soft steel is exported there is room for inference that the foreign mills are making more shell steel and less soft steel, eking out their production of the latter by greater imports from the United States. Thus there is good ground for assuming that any transfer of shell-making from the United States to the foreign countries is accompanied by correspondingly greater exports of the less finished steel. The American steel mills sell their steel abroad instead of to shell makers in the United States.

The export trade is now reaching a position in which it represents a really formidable part of our steel production. Hitherto the gains have been in percentages, in proportion to our export trade before the war, a trade that was really of almost insignificant proportions. The export business will probably have an important bearing on the course of the steel market during the remainder of the year.

The Reaction in Metals

Most memories are so short that it is not surprising to hear men marvel at the turn the metals have taken, despite the fact that for months they sagely predicted a reaction as well as "a day of reckoning." A few students of the market—usually those most interested, financially and otherwise—are not greatly disturbed. Some of them, in fact, consider it is better for all concerned if prices recede to a point somewhere near "normal" values, instead of figures war contractors were willing to pay because their need was imperative and the price would be paid in turn by buyers of munitions.

Despite the inactivity of recent weeks, copper has held up well, being now around 25.50 cents against 29 cents to 30 cents in May. The explanation of the dullness, as with the halt in steel buying, is that when prices began to advance consumers bought at a tremendous rate for the future, and they are believed to be covered for most of the year. Munitions makers bought as they booked contracts. A corollary of this buying is that the copper producers are in a comfortable position and see no need to create new activity in view of the highly profitable contracts on their books. Of late, it is true, certain producers have shaded their quotations to sell metal not under contract, but without avail, as lower prices have been made on resale metal.

Spelter has declined from 17 cents, New York, in May to about 9 cents. It sold at 21.50 cents, New York, in February. In the past few days galvanizers have begun to show interest, and if they could obtain future deliveries at prices proportionate to those for spot they would undoubtedly contract heavily. It has been noticed, however, that sellers, while willing to dispose of some metal for early shipment, show no enthusiasm when it comes to contracts. Meanwhile they must be content with large stocks, heavy production and the lack of new war business. An influence against foreign buying is an increased production in France, while Japanese spelter is being offered in Europe.

Lead commands a good price, but new war orders are essential if it is to be maintained. It has slumped under the efforts of independent producers to take business. The leading interest maintained its New York quotation at 7 cents for several weeks, but two weeks ago dropped to 6.50 cents, which the smaller producers at once proceeded to cut. In March lead touched 8 cents.

The decline in antimony has been spectacular. Chinese and Japanese grades were quoted at 45 cents to 46 cents in March, but since then have dropped to 15.50 cents, and are unsalable at this figure. The demand created by shrapnel requirements has passed. It is an open secret that money has been lost in antimony. Certain new smelters cannot operate at present prices except at a loss, despite the fact that the present price is three times that of normal times.

Straits tin, which a week ago was quoted at 38.50 cents, for spot, against 54 cents for a short time in March, has declined despite the oft-repeated emphasis on the British stringency in regard to shipping licenses. For a considerable time the resultant alarm tended to hold prices up, but the deliveries into consumption in June reached the large total of 6398 tons, proof that the metal is being consumed on a record scale. It is interesting to note that American deliveries in six months of this year totaled 28,621 tons, against 22,217 tons in the same period of 1915. These heavy shipments indicate a quiet market for the next few weeks, at least. Banca tin, which undersells Straits, has been a factor in the decline.

Consumers to whom buying from hand to mouth does not commend itself, besides being frequently impossible, will welcome the decline to more normal levels. To buy or not to buy has been the racking question, particularly with those whose requirements are for peaceful purposes. The situation created by the war unstrung the nerves of more than one.

It is probable that renewed buying will cause metal prices to rebound, but not to the levels which certain English purchasers have called "ridiculous." In London the declines have been so marked as to indicate the working of powerful influences. When the rebound does come, it is likely to be due to war demand, and thus the issue, like many another in industry and finance, runs into the endlessly recurring question of the war's duration.

Ferrosilicon Imports Larger

Imports of ferrosilicon have been increasing. Up to June 1 they were 3019 gross tons, or at the rate of 7248 tons per year. In 1915 they were 5226 tons, and in 1914, 6146 tons. The present import rate is the highest on record. Consumption has increased because of the demand for munition steel and the partial substitution of ferrosilicon for ferromanganese. The normal consumption has been estimated at 13,000 to 15,000 tons yearly. It is probably at least 50 per cent larger now.

A report on the tariff systems of South American countries has been issued by the Bureau of Foreign and Domestic Commerce, and a copy may be obtained for 25c. by applying to the Superintendent of Documents, Washington, D. C. It has been prepared primarily for the use of exporters and aims to cover not merely present tariff conditions, but their causes and the current tendencies.

CORRESPONDENCE

Buying Material on Scientific Basis

To the Editor: I cannot refrain from expressing to you my hearty approval of the excellent advice which H. B. Twyford has given to purchasers and sellers in general in his very able article, entitled "Buying Material on a Scientific Basis," as published in THE IRON AGE, July 6.

Purchasers are losing thousands of dollars annually through their failure to take proper advantage of market conditions. Inefficient systems and inadequate records, either in the purchasing or manufacturing or selling end of a business sometimes go far toward impairing the profits which would naturally accrue from economies maintained in any or all of the other branches or departments.

Both the purchaser and the seller can help each other in many little ways by having a better understanding of the requirements of the one and the abilities of the other and by being accurate, explicit, and brief in all interchanges of correspondence. Unnecessary or useless correspondence is frequent, owing, in the first place, to the purchasers not having a clear idea of the commodity manufactured by the seller, or owing to his failure to describe specifically the article he desires. On the other hand, some manufacturers are inexcusably ignorant regarding the quality of product required for a certain class of work and, therefore, must necessarily experiment by making trial shipments, etc.

A getting together of purchasers and sellers, either individually or collectively and discussing ways and means for mutual helpfulness, would effect much good, as each would then have a better understanding of the problems of the other, and intelligent co-operation would result.

The willingness to co-operate, even in the little ways, is not lacking, but the knowledge of how to co-operate, how to insure an order being filled properly and promptly and how to make it easier for the purchasing department to keep track of tonnage bought and shipping schedules and, shipment having been made, to approve easily and promptly the invoices for payment, is not so thoroughly understood and appreciated as it might be.

I sincerely trust that every subscriber to THE IRON AGE will read Mr. Twyford's article and believe that those who do read it will get much good from it.

C. I. SPROWL,

Mgr. Order Dept. American Rolling
Mill Company.

Middletown, Ohio,
July 13, 1916.

Canadian Cars for Russia

Canadian advices are that representatives of the Canadian Car & Foundry Company and the National Steel Car Company have been conferring with the Imperial Munitions Board at Ottawa, and it is expected that announcement of car contracts will be made within a few days. The cars are for the Russian Government, but the placing of the contracts and the financial arrangements are in the hands of the Imperial Munitions Board. The only question to be settled is whether the car companies will be in a position to make deliveries within the time limit.

The purchase of the Thomas B. Jeffery Company, Kenosha, Wis., manufacturer of automobiles and motor trucks, by Charles A. Nash, Flint, Mich., Lee, Higginson & Co., Boston, and allied interests, is confirmed by the Kenosha company. The formal transfer will take place August 1. Mr. Nash retires as head of the General Motors Company on that date, and will then undertake the management of the Kenosha company.

THE YEAR'S SHIPBUILDING

Increase of 61 Per Cent in Tonnage at Seaboard and Great Lakes Yards

WASHINGTON, D. C., July 18, 1916.—Shipbuilding in American yards scored an important gain during the fiscal year ended June 30, 1916, according to advance figures prepared by the Bureau of Navigation of the Department of Commerce. The output of the year was 1030 vessels of 347,847 gross tons, as compared with 1266 vessels of 215,711 tons during the fiscal year 1915. While this was a decrease of 19 per cent in the number of vessels built, it was an increase of 61 per cent in tonnage, the average of the vessels constructed having increased from 170 tons in 1915 to 338 tons in 1916.

The following statement shows the year's output according to material and power (gasoline included under steam) as compared with 1915:

	No.	1916, Gross Tons	No.	1915, Gross Tons
Wood:				
Sailing	47	16,087	50	7,241
Steam	594	18,781	743	27,082
Unrigged	285	62,844	357	60,188
Total	926	97,712	1,150	94,511
Metal:				
Sailing	1	27	1	27
Steam	86	245,212	68	120,385
Unrigged	18	4,923	7	788
Total	104	250,135	76	121,200
Totals:				
Sailing	47	16,087	51	7,268
Steam	680	263,993	811	147,467
Unrigged	303	67,767	364	60,976
Grand total.....	1,030	347,847	1,266	215,711

The seaboard yards have built 35 large steel merchant steamers aggregating 191,859 gross tons, the largest merchant steel output in their history. Of these, 21 steamers are each over 5000 gross tons, the largest being the steamship H. H. Rogers, of 10,050 gross tons, and 14 are between 3000 and 5000 gross tons each. The Newport News Shipbuilding & Dry Dock Company built 6 of 40,329 gross; the Maryland Steel Company, Sparrows Point, Md., 8 of 35,665 gross; Union Iron Works, San Francisco, Cal., 5 of 32,665 gross; New York Shipbuilding Company, Camden, N. J., 7 of 32,164 gross; and Fore River Shipbuilding Company, Quincy, Mass., 4 of 24,932 gross. The Newport News, Camden, and Quincy yards were also engaged in naval construction.

Of these steel ocean steamers, 24 of 138,858 gross tons have been registered for foreign trade, 8 of 34,386 gross tons enrolled for the coasting trade, one, the steamship Pacific, of 6034 gross tons, was sold to Norwegians, and up to June 30 the two remaining had not been documented.

Of the relatively small output of the Great Lakes, 8 vessels of 14,775 gross tons are each under 2,500 tons, built for the ocean trade, of which 4 are for foreign trade, and one (Morris Adler, 2481 gross) has been sold to Norwegians.

Steel Castings in 1915

Acid open-hearth steel castings constituted 54.7 per cent of the total output of basic and acid open-hearth castings in 1915, or 402,229 gross tons in a total of 735,332 tons. This is the largest proportion since 1906, when acid castings made up 56.5 per cent of the total open-hearth output. In 1910, acid castings comprised 53.3 per cent of the acid and basic open-hearth output.

The production of electric steel castings in the United States in 1915 was the largest ever recorded—23,064 gross tons—or about one-third of the total output of electric steel, which was 69,412 tons. The extent to which the demand for this grade of castings has grown is shown by the fact that the output for 1915 is only 2360 tons less than the total production of the country in the preceding six years, electric steel castings having been first made in 1909. In that year the output was 306 tons. In 1914 it was 8551 tons.

Twelve New Bethlehem Blast Furnaces

Four at Each of the Three Plants—
Large Additions to Steel Capacity,
with Important New Finishing Lines

The inspection of the newly acquired properties of the Pennsylvania Steel Company made by officers of the Bethlehem Steel Company last week, was, for some of them, the first thorough view of the improvements made at these plants in recent years. Much satisfaction was expressed with the condition of the properties. Very extensive improvements are to be made, which will represent an outlay of \$10,000,000 or \$12,000,000, at Steelton, Pa.; \$30,000,000 at the Sparrows Point plant, including the shipyards, and probably \$30,000,000 in a program extending over several years at the South Bethlehem works. The two new properties will be known hereafter as the Steelton plant and the Maryland plant of the Bethlehem Steel Company.

At Steelton, the new construction, which has thus far been only generally outlined, takes in the following: The rebuilding of the entire blast-furnace plant, giving four new furnaces in addition to the modern one which the Pennsylvania Steel Company completed last year. There will be entirely new power installations, based on blast-furnace gas engines—new electric, hydraulic, and steam plants. Work on two of the four new blast furnaces is already under way. An extensive by-product coke plant will be built. An additional 200-ton tilting open-hearth furnace will be provided, giving, with the existing six 100-ton stationary furnaces and two tilting furnaces, a capacity of 75,000 tons a month of finished material. There will be a new blooming and billet mill layout, and one or two small finishing mills will be added.

At Sparrows Point there are at present four large blast furnaces, all having been rebuilt in the past few years. Four additional blast furnaces will be built, and a new coke-oven plant to take care of them. A material increase will be made in the facilities for handling and treating the company's Cuban ores. This has not been fully worked out, but there may be a partial removal of moisture at the Felton plant in Cuba, and the finishing of nodulizing operations at Sparrows Point. Entirely new steel works will be built, consisting of three or four 200-ton tilting furnaces. The finishing capacity to be provided will consist of merchant bar mills, a tin plate and sheet plant, a plate mill, and a rod mill. The Bessemer plant at Sparrows Point will supply steel for the lines of lighter products which will be added, and it will also be operated in part in duplexing, in connection with the open-hearth furnaces. On the shipyards, about \$3,000,000 will be expended.

In the program for South Bethlehem, the important item is four new blast furnaces at the Saucon plant. Additional open-hearth steel capacity will be provided, also additional structural mills. A large capacity will be provided for the manufacture of ingot molds, and the sale of such molds to Eastern steel works will be entered upon actively. Car building is also a possibility at South Bethlehem.

STAFF CHANGES

Mention was made in THE IRON AGE of July 13 of a number of changes in the organization, resulting from the acquisition of the Steelton and Sparrows Point plants. The dissolution of the Pennsylvania Steel Company and the Maryland Steel Company carries with it the executives of the two companies. President E. C. Felton, who has been for many years prominent in the

Eastern steel trade, and has borne so important a part in the enlargement of the Pennsylvania Steel Company's operations and prestige, retires from the business, as he has for some time contemplated. One of the most conspicuous performances of Mr. Felton's administration was in the development of the Mayari ore deposits in Cuba, and previously in the taking over of the Spanish-American Iron Company, insuring an ore supply for many years to come.

The withdrawal is also announced of Frank Tenney, long well known in the Eastern steel trade as secretary of the company and assistant to the president. F. W. Wood, who has been at the head of the Sparrows Point enterprise from its inception, will be general manager of the Maryland plant, which, with the expenditures contemplated, assumes an importance both in shipbuilding and steel making it has not had before. M. J. Scannell becomes general superintendent of the steel plant at Sparrows Point, and S. Anderson continues as manager of the shipyards.

In connection with the taking over of the bridge department at Steelton, there will be organized the Bethlehem Steel Bridge Company of Delaware. G. H. Blakely, who is in charge of the structural department of the Bethlehem Steel Company, becomes president of the bridge company, and Thomas O. Earle will be vice-president. It is the intention of the bridge company to operate as heretofore on bridge work, and there will be no competition in steel structural work between the bridge company and the various fabricating interests to which the Bethlehem Steel Company has long supplied material.

J. H. Myers becomes assistant superintendent of the bridge and construction department of the Steelton plant, succeeding Carl B. Ely, who has been made superintendent. W. J. Collier has been made plant engineer in the bridge and construction department. Reinhard Heern, civil engineer in the same department at Steelton, will be connected with the sales and engineering force at South Bethlehem, Pa. Richard M. Kreutz, civil engineer, has been similarly transferred.

Car and Locomotive Orders in 1916

A comparison of orders for locomotives and freight and passenger cars for the first half of 1916 and 1915 is given as follows by the *Railway Review*:

	Locomotives		Freight Cars		Passenger Cars	
	1916	1915	1916	1915	1916	1915
January	164	137	12,300	2,600	59	59
February	246	57	12,833	4,267	148	231
March	576	109	13,591	1,026	150	55
April	273	25	8,628	1,065	103	145
May	252	109	7,191	30,029	34	191
June	247	454	3,441	7,164	163	74
Total	1,758	891	57,984	46,151	657	745

The principal foreign orders are included. Excluding all foreign orders except those of Canada, locomotives ordered to July 1 were 1580, against 384 to July 1, 1915, and 1500 domestic locomotives ordered in all of 1915. About one-third of the freight cars ordered in the first half of 1915 were foreign, Russia alone ordering 13,160.

In THE IRON AGE of July 6, 1916, it was stated that the New York Central Lines had placed an order for 25 Mallet locomotives with the Baldwin Locomotive Works. This order was given to the American Locomotive Company.

Specifications for Spikes and Tie Plates

Among the specifications which the American Society for Testing Materials approved at its annual meeting in Atlantic City, June 28, were three specifications, one on steel track spikes, one on steel screw spikes, and one on steel tie plates. These are all to be published in the forthcoming year book of the society as tentative specifications. They are, accordingly, subject to modifications, and are to come up at the annual meeting next June for final consideration, when, in their approved form, they are likely to be submitted to the membership for a mail ballot before becoming the standard A. S. T. M. specifications.

TRACK AND SCREW SPIKES

The spikes may be made of Bessemer or open-hearth steel.

The track spikes must be made of steel showing a minimum tensile strength of 55,000 lb. per square inch, while the steel for the screw spikes must have a tensile strength of 60,000 lb. per square inch. The yield point of the steel in the two cases must be equivalent to one-half the tensile strength, and the elongation 25 per cent in 2 in. for the track spikes, and 20 per cent in 2 in. for the screw spikes.

Bend tests are specified as follows: The body of the full-sized finished track spike shall bend cold through 180 deg. flat on itself, without cracking on the outside of the bent portion. The head of the full-sized finished spike shall bend backward to the line of the face of the spike without cracking on the outside of the bent portion. A tension and bend test is required from each lot of 10 tons, or fraction thereof.

For the screw spikes, the bend test requires that the full-sized finished spike shall bend cold through 90 deg. around a pin the diameter of which is equal to three times the diameter of the spike, without cracking on the outside of the bent portion. A tension and a bend test is to be made from each lot of 100 kegs, or fraction thereof.

A variation of 1/64 in. under the specified dimension of the body of the track spike, measured from the face to the back, and a variation of 1/32 in. over the specified dimension of the body of the spike, measured across the face, will be permitted. A variation of 3/32 in. over and 1/32 in. under the specified dimensions of the head of the spike will be permitted.

A variation of 1/32 in. over and under the specified diameter of the unthreaded portion of the body of the screw spike, and a variation of 1/32 in. over the specified diameter of the threaded portion of the spike will be permitted.

STEEL TIE PLATES

For tie plates, the open-hearth steel shall have not over 0.05 per cent phosphorus. The tensile strength shall be 64,000 lb. per square inch, as a minimum, the yield point one-half of the tensile strength, and the elongation 18 per cent in 2 in., except for tie plates, in which the material to be punched is over 5/8 in. in thickness, in which case the allowable tensile strength is 55,000 to 65,000 lb. per square inch; the yield point one-half of the tensile strength, and the elongation 25 per cent in 2 in.

The bend test requires bending cold through 180 deg. around a pin the diameter of which is equal to twice the thickness of the specimen. The different test specimens must be taken from finished tie plates, and in a direction parallel to that in which the tie plates have been rolled. The bend-test specimens must be rectangular in section, and not less than 1/2 in. in width between the planed sides, with two parallel bases as rolled, with the corners rounded to a radius not over 1/16 in. When the tie plates are of such a design that the rectangular specimens cannot be obtained without projecting ribs, these shall be planed off before the tests are made.

A variation in thickness of 1/32 in. and in width and length of 1/8 in., is permitted in the case of plates with shoulders parallel to the direction of rolling. The variation in length allowed in the case of plates with shoulders perpendicular to the direction of rolling is 1/4 in.

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Iron and Steel Markets

EXPORT SALES GROWING

The Main Source of Market Strength

Steel Output Affected by Heat—Allies' Requirements Are Still Large

The increasing tonnage of export sales and of foreign inquiry overhanging the steel market is strengthening the position of the steel works in respect to this year's deliveries. Most domestic consumers, having bought what they will require in the next four or five months, are not actively competing for steel with foreign buyers as they were earlier in the year. But with light home buying, each week is increasing the proportion of export steel on the makers' books, and the question of the amount available for home use in the first quarter of 1917 will soon be of live interest.

There is more emphasis this week on the reduced output of steel mills due to the heat, particularly in the middle west. In the Connellsville region production has suffered enough from the same cause to advance prices for prompt coke. In Alabama, steel works operations have been greatly interfered with by storms, one large plant having its output cut down about 50 per cent.

The week has brought out a fresh installment of foreign requirements, in which 100,000 tons of shell steel for France is prominent and about 50,000 tons of 6-in. to 12-in. beams, to be shipped at the rate of 8000 tons a month through this year. Russia has made some redistribution of barb wire business, by which 50,000 tons goes to three independent makers. A Russian spike purchase of 50,000 kegs is pending. There is also active inquiry from Canada for shell steel and it is known that Great Britain is still seeking to place 6-in. to 12-in. shells and the steel for them, with deliveries extending to April. Russia is expected to place large car orders in this country and Canada and has just bought from two American makers 28,000 axles, with cast iron wheels mounted, for repair purposes.

An important Chicago district contract just closed is for 50,000 tons of forging billets for delivery in fourth and first quarters. The semi-finished steel market at Pittsburgh is stronger than in recent weeks.

Rail mills are adding to their bookings for 1917, and several large lots are up for this year. France has just placed 14,000 tons. South Africa is inquiring for 12,000 tons. The Canadian Pacific is expected to buy much more than the 30,000 tons on which bids are asked, in view of its large sale of

rails from its sidings to the British Government.

A Canadian mill, unable to buy blooms on this side to fill its rail orders from American roads, is now seeking to place the rails here.

A late increase in premium business, coming in connection with larger foreign demand, has caused some producers to look for an early renewal of domestic buying of plates, shapes and bars, but in most lines the indications are rather for the continuance of present conditions into fall.

The continued declines in metals, most pronounced in spelter, are having their effect on certain rolled steel products. Galvanized sheets have sold down to 4.25c., Pittsburgh, for heavier gages, and the galvanized pipe market has been disturbed by jobbers selling below manufacturers' prices. Some sheet mills are disposed to insist on consumers taking out the 5-c. galvanized sheets placed when spelter was high. At the same time galvanized sheet production promises to run up, as the dangers of the spelter market have disappeared.

Steady buying of Bessemer pig iron for export has been practically without effect on prices, and the foundry iron market is at low ebb for the year in point of activity.

Several Mesaba underground mines have resumed operations, and the strike is breaking, but enough miners have left the district to make it quite certain the scheduled output at some properties will not be reached. Deeper water in Great Lakes channels will help the vessel situation materially, so that a 60,000,000-ton ore movement is more confidently looked for to-day.

Pittsburgh

PITTSBURGH, PA., July 18, 1916.

The feature of the market is the continued export demand for Bessemer iron, mostly for Italy; for small billets, 4 x 4-in. billets and sheet bars, either Bessemer or open-hearth; for beams for shipment to France, also for other lines of finished steel. Already a good deal of foreign business has been done in Bessemer pig iron and in open-hearth and Bessemer steel, with a large amount still pending. Semi-finished steel appears harder to obtain and is higher in price than was the case late in May and early June. In the early part of June there were three or four sources of supply of steel for nearby delivery, but these are now closed, and it is very hard to obtain either Bessemer or open-hearth steel in any large quantities for export shipment. Output of nearly all kinds of finished steel has been materially cut down so far in July by the very hot weather. Coke output, for the same reason, has gone down a good deal and furnace coke for prompt shipment is scarce and bringing high prices. Sales are reported at \$2.75 per net ton at oven for the best grades. The rapid decline in spelter has upset the market on galvanized products, and lower prices are looked for on galvanized iron and steel pipe and probably also on wire products on or before Aug. 1. Prices on galvanized sheets have declined sharply and several mills that have not turned out any for some time are likely to be making them again if prices of spelter should go any lower. The

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics
At date, one week, one month, and one year previous

Pig Iron, Per Gross Ton:	July 19, 1916.	July 12, 1916.	June 21, 1916.	July 21, 1915.
No. 2 X, Philadelphia....	\$19.75	\$19.75	\$19.75	\$14.25
No. 2, Valley furnace....	18.25	18.25	18.25	12.75
No. 2, Southern, Cin'tl....	16.90	16.90	17.40	12.65
No. 2, Birmingham, Ala....	14.00	14.00	14.50	9.75
No. 2, furnace, Chicago*..	19.00	19.00	19.00	13.00
Basic, del'd, eastern Pa....	19.00	19.00	19.50	14.00
Basic, Valley furnace....	18.00	18.00	18.00	13.00
Bessemer, Pittsburgh....	21.95	21.95	21.95	14.95
Malleable Bess., Ch'go*..	19.50	19.50	19.50	13.00
Gray forge, Pittsburgh....	18.70	18.70	18.70	13.45
L. S. charcoal, Chicago....	19.75	19.75	19.75	15.75

Billets, etc., Per Gross Ton:	July 19, 1916.	July 12, 1916.	June 21, 1916.	July 21, 1915.
Bess. billets, Pittsburgh..	40.00	40.00	42.00	22.00
O.-h. billets, Pittsburgh..	42.00	42.00	42.00	22.00
O.-h. sheet bars, P'gh....	42.00	42.00	42.00	23.00
Forging billets, base, P'gh	69.00	69.00	69.00	28.00
O.-h. billets, Phila.....	45.00	45.00	50.00	24.56
Wire rods, Pittsburgh....	55.00	55.00	55.00	25.50

Finished Iron and Steel, Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Bess. rails, heavy, at mill	1.47 1/2	1.47 1/2	1.47 1/2	1.25
O.-h. rails, heavy, at mill	1.56 1/2	1.56 1/2	1.56 1/2	1.34
Iron bars, Philadelphia....	2.659	2.659	2.659	1.22 1/2
Iron bars, Pittsburgh....	2.50	2.50	2.50	1.25
Iron bars, Chicago.....	2.35	2.35	2.35	1.20
Steel bars, Pittsburgh....	2.30	2.75	2.75	1.25
Steel bars, New York....	2.669	2.669	2.919	1.419
Tank plates, Pittsburgh..	3.50	3.50	3.75	1.25
Tank plates, New York....	3.669	3.669	3.919	1.369
Beams, etc., Pittsburgh..	2.50	2.50	2.50	1.25
Beams, etc., New York....	2.669	2.669	2.669	1.419
Skelp, grooved steel, P'gh	2.35	2.35	2.35	1.20
Skelp, sheared steel, P'gh	2.45	2.45	2.45	1.25
Skelp hoops, Pittsburgh..	2.75	2.75	2.75	1.30

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Sheets, Nails and Wire, Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, P'gh.	2.90	2.90	2.90	1.75
Galv. sheets, No. 28, P'gh.	4.25	4.50	4.60	4.50
Wire nails, Pittsburgh....	2.50	2.50	2.50	1.60
Cut nails, Pittsburgh....	2.60	2.60	2.60	1.55
Fence wire, base, P'gh....	2.45	2.45	2.45	1.40
Barb wire, galv., P'gh....	3.35	3.35	3.35	2.40

Old Material, Per Gross Ton:	July 19, 1916.	July 12, 1916.	June 21, 1916.	July 21, 1915.
Iron rails, Chicago.....	18.50	18.50	18.00	12.25
Iron rails, Philadelphia..	20.00	20.00	20.00	15.50
Carwheels, Chicago.....	12.00	12.00	12.25	11.25
Carwheels, Philadelphia..	15.00	16.00	16.50	12.50
Heavy steel scrap, P'gh..	16.50	16.50	15.75	12.75
Heavy steel scrap, Phila..	15.00	15.00	15.00	12.25
Heavy steel scrap, Ch'go..	14.00	14.00	14.50	10.50
No. 1 cast, Pittsburgh....	15.75	15.75	15.75	12.25
No. 1 cast, Philadelphia..	16.00	16.00	16.00	12.50
No. 1 cast, Ch'go (net ton)	11.50	11.50	11.50	9.25

Coke, Connellsville, Per Net Ton at Oven:	July 19, 1916.	July 12, 1916.	June 21, 1916.	July 21, 1915.
Furnace coke, prompt....	\$2.75	\$2.75	\$2.40	\$1.60
Furnace coke, future....	2.50	2.50	2.50	1.75
Foundry coke, prompt....	3.25	3.25	3.25	2.00
Foundry coke, future....	3.50	3.50	3.50	2.25

Metals, Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York....	25.25	26.00	27.75	22.00
Electrolytic copper, N. Y.	25.00	25.75	27.00	19.00
Spelter, St. Louis.....	9.00	8.75	12.25	20.00
Spelter, New York.....	9.25	9.00	12.50	20.25
Lead, St. Louis.....	6.10	6.25	6.45	5.50
Lead, New York.....	6.25	6.45	6.62 1/2	5.55
Tin, New York.....	37.25	38.50	40.75	36.62 1/2
Antimony, Asiatic, N. Y.	14.00	15.50	18.00	35.50
Tin plate, 100-lb. box, P'gh	\$6.00	\$6.00	\$5.75	\$3.10

usual mid-summer dullness has settled down over the steel trade, and there will be little snap to it this month and August, but there is likely to be a buying movement early in September to cover needs of consumers for last quarter of this year and first quarter of 1917. The scrap market has settled down after the recent purchases of heavy melting steel.

Pig Iron.—The domestic trade is very quiet, but the export inquiry for Bessemer iron is estimated to be from 40,000 to 50,000 tons. One lot of 10,000 tons has been sold and smaller lots have aggregated as much more, with the demand still insistent. Italy is using this iron in making steel for shrapnel and other purposes. Nearly all the Bessemer iron for export has been sold at \$21, at Valley furnace, but on one lot of 500 tons for quick shipment \$21.15 at furnace was paid. Ella furnace of Pickands, Mather & Co., at Sharpsville, Pa., has had an accident and will be out of blast for a month or more. It was running on Bessemer iron and its going out will add to the shortage of Bessemer iron for early shipment. In spite of the heavy demand for Bessemer, and to some extent for basic, prices show no signs of being higher. Shippers report consumers are taking their iron freely and there is little in stock at any of the furnaces. We quote Bessemer iron at \$21; basic, \$18; gray forge, \$17.75 to \$18; malleable Bessemer, \$18.50 to \$19, and No. 2 foundry, \$18.25 to \$18.50, all at Valley furnace, the freight rate to the Pittsburgh and Cleveland districts being 95c. per gross ton.

Ferrolloys.—With little new inquiry for ferromanganese for prompt shipment or on contract, prices are soft. Domestic 80 per cent is being offered freely for shipment over the remainder of the year at \$175 at maker's furnace, and for prompt shipment at about \$200 at furnace. English 80 per cent on contract for next year is unchanged at \$175, seaboard. Spiegeleisen is easier, 18 to 22 per cent ranging from \$45 to \$50, and 25 to 30 per cent from \$60 to \$70 at furnace. We quote 50 per cent ferrosilicon at \$85 in lots up to 100 tons; over 100 tons and up to 600 tons, \$84, and over 600 tons, \$83, all per gross ton, f.o.b., Pittsburgh. For some time one furnace making Bessemer ferrosilicon has been naming a price \$2 per ton less than others, and one or two other makers are now meeting this price. We quote Bessemer ferrosilicon as follows: 9 per cent,

\$30; 10 per cent, \$31; 11 per cent, \$32; 12 per cent, \$33; 13 per cent, \$34.50; 14 per cent, \$36.50; 15 per cent, \$38.50, and 16 per cent, \$41. Seven per cent silvery is \$28.50; 8 per cent, \$29; 9 per cent, \$29.50; 10 per cent, \$30; 11 per cent, \$31, and 12 per cent, \$32. These prices are f.o.b. at furnace, Jackson or New Straitsville, Ohio, or Ashland, Ky., all having a freight rate of \$2 per gross ton to Pittsburgh.

Billets and Sheet Bars.—There is insistent foreign inquiry for Bessemer and open-hearth steel in the form of 2-in. billets, 4 x 4-in. billets and sheet bars, and in some cases ingots have been shipped abroad to be bloomed on the other side. Nearly all this inquiry is for prompt shipment, and it is estimated that at present there are inquiries in this market for 75,000 to 100,000 tons of Bessemer and open-hearth steel in the various forms noted above. Sales reported for export include 6000 tons of Bessemer sheet bars at \$43.50, 2000 tons of small open-hearth billets at about \$43, and 5000 to 6000 tons of billets and slabs at about \$45, f.o.b., Pittsburgh. There is also a heavy domestic demand for semi-finished steel, shipments to sheet and tin plate mills being heavier now than for several months. Prices are very strong and it is hard to find any soft open-hearth steel at much less than \$45 at mill. One Youngstown, Ohio, open-hearth plant has been a heavy buyer of steel lately in the open market to help out on its contracts for sheets and other products. We quote soft open-hearth billets and sheet bars at \$42 to \$45; Bessemer billets, \$40 to \$42, and Bessemer sheet bars, \$40 to \$42, maker's mill, Pittsburgh or Youngstown district. We quote forging billets at \$69 for sizes up to but not including 10 x 10 in., and for carbons up to 0.25, the regular extras being charged for larger sizes and higher carbons. Forging billets running above 0.25 and up to 0.60 carbon take \$1 extra.

Plates.—Early deliveries of plates are harder to obtain now than a month or more ago, and higher prices are being paid. The demand for plates from the shipyards is enormously heavy and promises to be for the next year or more. From steel car builders the demand is still very urgent, but unless more orders for steel cars are placed, the steel car companies will be short of work by September or before. The Delaware & Hudson Railroad is in the market for 1000 70-ton steel hop-

per cars, similar in design to those bought by the Pennsylvania Railroad several months ago. The Steel Corporation has placed orders for 448 steel cars for subsidiary interests, most of these going to the Pressed Steel Car Company. Prices on plates are very strong, and we quote $\frac{1}{4}$ -in. and heavier plates for delivery in two to four months at 3.50c. to 4c. at mill. One maker reports sales of about 4000 tons of $\frac{1}{4}$ -in. sheared plates at the higher price for delivery in two to three months. The mill contract price remains at 2.75c., but when this price is quoted the mill could probably not ship out under five to six months. The Carnegie Steel Company is well sold up on plates into first half of 1917, and two other mills report they have very few plates to spare for delivery before first quarter of next year.

Structural Material.—In the past week, inquiries have come in this market from France for 40,000 to 50,000 tons of 5-in. to 12-in. beams, for 3000 to 4000 tons of structural steel for a sugar plant in Cuba, for 1000 tons for a sugar mill in Hayti and for about 1000 tons for pulp and paper mills in Canada. The Jones & Laughlin Steel Company has taken 1000 tons for an addition to Mercy Hospital, in this city, and 200 tons for a restaurant building at the Panama Canal, and the McClintic-Marshall Company will furnish 500 tons for a bridge for the Southern Railway over the James River, in Virginia. Work in the market includes a bridge for the New York Central near Youngstown, Ohio, 700 tons; about 500 tons for new building for the United States Aluminum Company at Massena Springs, N. Y. We quote beams and channels up to 15 in. at 2.50c. to 2.75c. at mill, for delivery in third and fourth quarters, while small lots from stock are held at 3.25c. up to 4c., prices depending entirely on the size of the order and how soon deliveries are wanted.

Steel Rails.—The Carnegie Steel Company is sold up on standard sections into third quarter of 1917, and for almost the same extent on light rails. The new demand for light rails is only fair, the traction and lumber interests buying very few, but the coal-mining interests are placing fair-sized orders. We quote 25 to 45-lb. sections at \$47; 16 and 20-lb., \$48; 12 and 14-lb., \$49; and 8 and 10-lb., \$50 in carload lots, f.o.b. at mill, the usual extras being charged for less than carload lots. We quote standard section rails of Bessemer stock at 1.47 $\frac{1}{2}$ c., and of open-hearth, 1.56 $\frac{1}{2}$ c., Pittsburgh.

Sheets.—Some of the larger sheet mills are insisting that customers who placed contracts some months ago for galvanized sheets, on the basis of 5c. for No. 28 gage, must take out these sheets, and in one or two cases litigation may result. Prices on galvanized sheets are weak and lower, due to the heavy decline in spelter, but the new demand is reported a little better. On electrical sheets, mills are sold up for eight to ten months, on blue annealed five to six months, but on light black and galvanized some mills can make fairly prompt deliveries. We quote blue annealed sheets, Nos. 9 and 10, at 3c. to 3.25c., for delivery at convenience of the mill, which would be late this year. We quote No. 28 Bessemer and open-hearth black sheets at 2.90c. to 3c.; No. 28 galvanized, Bessemer, and open-hearth, 4.25c. to 4.35c.; Nos. 22 and 24 black plate, tin-mill sizes, H. R. & A., 2.90c.; Nos. 25, 26, and 27, 3c. to 3.10c.; No. 28, 3.10c. to 3.15c.; and No. 29, 3.20c. to 3.25c. These prices are for carloads and larger lots, f.o.b. mill, Pittsburgh.

Tin Plate.—It develops that the advertisement of a second-hand machinery interest, offering 300,000 boxes of tin andterne plate for this year delivery, probably refers to product which is expected to be made in a mill at Marietta, Ohio, which has been inactive for a long time. Some new interests have secured control of this mill, and, if arrangements can be made for sheet bars, will start it up on bright andterne plate. The domestic demand for tin plate is fairly heavy, but export demand has quieted down. Some of the larger makers have their output sold up for this year, and are not quoting on any new foreign or domestic inquiry. We quote wasters from stock at \$5.75 to \$6, and primes at \$6

to \$6.25 to the domestic trade, while for export, \$6.25 per base box, and higher, is quoted. We quote 8-lb. coated ternes at \$8.50 to \$8.75 for 200 lb., and \$8.75 to \$9 for 214 lb., all f.o.b. Pittsburgh.

Skelp.—The Jones & Laughlin Steel Company expects to start one of its new skelp mills at Aliquippa, Pa., in August and the other later in the year. Very wide plates for large sizes of pipe will be rolled in the South Side mills of this company and shipped to Aliquippa. The new demand for skelp is quiet, but mills have their output sold up for three or four months ahead. We quote grooved steel skelp at 2.35c. to 2.40c.; sheared steel skelp, 2.45c. to 2.50c.; grooved iron skelp, 2.70c. to 2.80c., and sheared iron skelp, 3c. to 3.10c., all delivered to consumers' mills in the Pittsburgh district.

Cold-Rolled Strip Steel.—Contracts for 500 to 600 tons of cold rolled strip steel were made recently for delivery over remainder of this year at \$6 per 100 lb. Most consumers are covered for five or six months ahead and some mills have their output sold up for all of this year. On small lots for shipment in two to three months, the mills quote from \$6.50 to \$7, or higher, per 100 lb. On contracts we quote cold-rolled strip steel at \$6 per 100 lb., base, and on small lots for fairly prompt delivery, from \$6.50 to \$7. Extras, standard with all the mills, were printed on page 810 of The Iron Age of March 30.

Railroad Spikes.—The new demand is quiet and specifications are dull. Two makers of spikes that do not have enough orders to run their spike departments full are now diverting the steel to other products. Regular prices, which are not always strictly observed, are as follows:

Standard railroad spikes, $4\frac{1}{2}$ x 9/16 in. and larger, \$2.65 to \$2.75; railroad spikes, $\frac{1}{2}$ and 7/16 in., \$2.75 base; railroad spikes, $\frac{3}{4}$ in. and 5/16 in., \$3.05 base; boat spikes, \$2.80 base, all per 100 lb., f.o.b. Pittsburgh.

Nuts and Bolts.—Makers report domestic demand fairly heavy, but most consumers are covered for this year. The export demand has quieted down a good deal. Discounts in effect from May 19, which the makers state are for prompt acceptance only, are as follows, delivered in lots of 300 lb. or more where the actual freight rate does not exceed 20c. per 100 lb., terms 30 days net, or 1 per cent for cash in 10 days:

Carriage bolts, small, rolled thread, 50 and 10 per cent; small, cut thread, 50; large, 40.

Machine bolts, h. p. nuts, small, rolled thread, 50, 10 and 5 per cent; small, cut thread, 50 and 5; large, 40 and 10.

Machine bolts, c. p. c. and t. nuts, small, 40, 10 and 5 per cent; large, 35 and 5. Blank bolts, 40 and 10 per cent; bolt ends with h. p. nuts, 40 and 10; with c. p. nuts, 35 and 5. Rough stud bolts, 15. Lag screws (cone or gimlet point), 50 and 10.

Forged set screws and tap bolts, 10 per cent. Cut and round point set screws, case hardened, 60. Square and hexagon head cap screws, 55. Flat, button, round or fillister head cap screws, 30.

Nuts, h. p. sq., tapped or blank, \$2.90 off list; hex., \$2.90 off; c. p. c. and t. sq. tapped or blank, \$2.60 off; hex., \$3 off; semi-finished hex., 60 and 10 per cent; finished and case hardened, 60 and 10.

Rivets, 7/16 in. in diameter and smaller, 45, 10 and 10 per cent.

Wire Rods.—The quotation of \$50 to \$55 in the Pittsburgh market report in the issue of THE IRON AGE of July 6, on soft Bessemer, open-hearth and chain rods was a typographical error; it should have been \$55 to \$60 per ton. Local makers who have been shipping rods into Canada have been declaring a value on these of \$55 and \$60 for some time. The demand for rods is reported fairly heavy and consumers are specifying very freely against their contracts. We quote soft Bessemer, open-hearth and chain rods at \$55 to \$60 per ton, f.o.b. Pittsburgh.

Wire Products.—Summer dullness has settled down on the wire trade and mills report specifications only fair. It is said an advance in wire products may be made early in August, or about as the trade starts to cover for its fall requirements. The situation in galvanized wire is complicated, due to the heavy decline in prices of spelter, and it is possible a readjustment in prices on galvanized wire may be made before long

to a somewhat lower basis. Regular prices are as follows: Wire nails, \$2.50 to \$2.60 per keg; galvanized, 1 in. and longer, taking an advance over this price of \$2, and shorter than 1 in., \$2.50. Plain annealed wire, \$2.45 to \$2.65 per 100 lb.; galvanized wire, \$3.15; galvanized barb wire and fence staples, \$3.35; painted barb wire, \$2.65; polished fence staples, \$2.65; cement coated nails, \$2.50, base, all f.o.b. Pittsburgh, with freight added to point of delivery, terms 60 days net, less 2 per cent off for cash in 10 days. Discounts on woven wire fencing are now 61½ per cent off list for carload lots, 60½ per cent for 1000-rod lots and 59½ per cent for small lots, f.o.b. Pittsburgh.

Iron and Steel Bars.—A local interest is reported to have taken a contract for 30,000 to 35,000 tons of steel rounds for the Allies at 3.50c. per pound for shipment over remainder of this year. Local makers of steel bars say they have not taken agricultural contracts recently. One local maker of steel bars is holding firmly for 2.50c. on contracts with implement makers for first half of next year. The general bar market remains at 2.50c. for such deliveries as the mills can make, which would not be before last quarter and possibly not before first quarter of next year. One mill is quoting Bessemer steel bars for delivery in two to three months at 2.50c.

Rivets.—Makers report the new demand only fairly heavy, consumers being covered and makers sold up for most of the year. Some jobbers who have stocks of rivets on hand bought when prices were lower than they are now are shading makers' prices to some extent. We quote buttonhead structural rivets, ½ in. in diameter and larger, at \$4 per 100 lb., base, and conehead boiler rivets, same sizes, \$4.10 per 100 lb., base, f.o.b. Pittsburgh. Terms are 30 days net, or one-half of 1 per cent for cash in 10 days.

Shafting.—The consuming trade is well covered over remainder of this year and is specifying freely against contracts, some of which were made at 20 per cent off list and a few at 15 per cent off list. For early shipment and small lots, sales of shafting have been made at very close to base price. We quote cold-rolled shafting at 20 to 15 per cent off in carload lots for delivery in last quarter of this year and first quarter of 1917, and 10 per cent off in less than carload lots, f.o.b. Pittsburgh, freight added to point of delivery.

Cotton Ties.—The cotton tie business for this year is pretty well closed up, the consumption having been estimated at 2,800,000 bundles, of which 2,000,000 bundles will be rolled by the mills for this season's trade, the remaining 800,000 bundles being in stock carried over from last year. We quote cotton ties at \$1.35 per bundle of 45 lb., f.o.b. Pittsburgh, for July shipment, with an advance of ¼c. per pound for August and an additional ¼c. for September delivery.

Merchant Steel.—The new demand is mostly for small lots, leading consumers being covered over remainder of the year, and shipments by the mills are heavy. Prices on small lots are about as follows: Iron-finished tire, ½ x 1½ in. and larger, 2.50c., base; under ½ x 1½ in., 2.60c.; planished tire, 2.70c.; channel tire, ¾ to ¾ and 1 in., 2.85c. to 2.95c.; 1½ in. and larger, 3.25c.; toe calk, 2.95c. to 3.05c., base; flat sleigh shoe, 2.70c.; concave and convex, 2.75c.; cutter shoe, tapered or bent, 3.25c. to 3.35c.; spring steel, 2.95c. to 3.05c.; machinery steel, smooth finish, 2.75c.

Hoops and Bands.—Demand is quiet and specifications against contracts are reported heavy. We quote steel hoops at 2.75c. and steel bands at 2.50c., extras on the latter as per the steel-bar card.

Wrought Pipe.—The present situation as to prices on galvanized iron and steel pipe is giving the makers some concern. A few jobbers who have fairly large stocks bought at favorable prices are anxious to move these, and are naming better discounts in some cases than the mills. It is expected, therefore, that a readjustment in prices of galvanized pipe to a lower basis will be made within the next two or three weeks. On lap weld pipe the mills are sold up for five to six months, but on butt weld sizes there is no trouble in getting prompt delivery. There is a very heavy de-

mand for oil country goods and prices are firm. Discounts on black and galvanized pipe are given on another page.

Boiler Tubes.—Demand is active, in spite of the fact that on both locomotive and merchant tubes makers are sold up for five or six months and are much behind in deliveries. Discounts on iron and steel boiler tubes are holding very firm and are given on another page.

Old Material.—It is intimated that in the recent purchases of steel scrap higher prices were paid than were generally reported, due to the fact that the important companies in the market wanted large lots and the scrap centers had to be scoured thoroughly to get enough scrap to fill their contracts. To-day there is only a fair demand, with prices ruling steady. A sale of 500 tons of low-phosphorus melting stock is reported at \$19.25, delivered at buyer's mill, and we note sales of 2000 to 2500 tons of borings and turnings at about \$8.50, delivered. It is said that heavy steel scrap can be obtained to-day at about \$1.50 per ton less than was paid on the heavy purchases of two weeks ago. Dealers are now quoting for delivery in the Pittsburgh and nearby districts that take the same rates of freight, per gross ton, as follows:

Heavy steel melting scrap, Steubenville, Follansbee, Brackenridge, Sharon, Monessen, Midland and Pittsburgh, delivered	\$16.50 to \$16.75
No. 1 foundry cast	15.75 to 16.00
Re-rolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	16.50 to 16.75
Hydraulic compressed sheet scrap... ..	14.50 to 14.75
Bundled sheet scrap, sides and ends, f.o.b. consumers' mills, Pittsburgh district	12.50 to 12.75
Bundled sheet stamping scrap.....	11.50 to 11.75
No. 1 railroad malleable stock.....	14.00 to 14.25
Railroad grate bars	11.00 to 11.25
Low phosphorus melting stock.....	19.00 to 19.50
Iron car axles	25.50 to 26.00
Steel car axles	26.00 to 26.50
Locomotive axles, steel	28.00 to 28.50
No. 1 busheling scrap	13.25 to 13.50
Machine-shop turnings	8.50
Old carwheels	14.00 to 14.50
Cast-iron borings	8.50
*Sheet bar crop ends	16.00 to 16.50
No. 1 railroad wrought scrap.....	18.75 to 19.00
Heavy steel axle turnings.....	12.00 to 12.25
Heavy breakable cast scrap.....	13.50 to 13.75

*Shipping point.

Coke.—The excessively hot weather of the past two weeks has cut down output of coke very materially, and furnace coke for prompt shipment is scarce and is bringing relatively high prices. Last week there were sales of 200 to 300 cars of blast furnace coke at prices ranging from \$2.40 up to \$2.65 per net ton at oven, but on Monday and Tuesday of this week there were sales of upward of 100 cars at \$2.75 per net ton at oven, and a few makers asking as high as \$2.85. The demand for furnace coke on contracts has quieted down, as nearly all furnaces are covered. We quote high grade blast furnace coke for prompt shipment at \$2.75 per net ton at oven, and on contracts over remainder of the year from \$2.35 to \$2.65 per net ton at oven. We quote best grades of 72-hr. foundry coke for prompt shipment at \$3 to \$3.25 and on contracts from \$3.25 to \$3.50 over remainder of the year. The Connellsville Courier gives the output of coke for the week ending July 8 as 359,530 tons, a decrease from the previous week of 64,020 tons. This is the largest decrease in any one week for some months, and was due to the hot weather and a scarcity of labor supply, which is being severely felt.

The Baltimore & Ohio Railroad has donated to the Industrial Commission of Ohio a steel car to be used in demonstrating modern safety devices. The car will be equipped early in September by various manufacturing companies, as well as by the commission, with models of safety devices and exhibits illustrating proper sanitation and ventilation. It will be sent into the yards of industrial plants throughout the State, so that employers and workmen may inspect the exhibits. The Industrial Commission of Ohio is also preparing a motion-picture film showing the working of the compensation law in Ohio, and particularly the causes of accidents as reported to the commission.

Chicago

CHICAGO, ILL., July 17, 1916.

The actual placing on the books of new export business, running into large figures, has added perceptibly to the strength of the mill situation. The further probability of rails and forging steel being closed here in the next few days to the amount of at least 50,000 tons each, also emphasizes the important bearing of the activity of foreign buyers on first-half protection for domestic consumers. In a number of instances buyers from the general manufacturing trade have been seeking assurances from the mills that their first half needs will be taken care of, and business so reserved now aggregates a large total. As an indication that they expect history to repeat itself in that the present activity in export sales will be followed by a period of domestic buying, steel manufacturers note an increase in the amount of premium business in the past week. Of the Russian rail order 90,000 tons has been placed here, together with the track fastenings. Local mills have also quoted on large requirements which Canadian railroads are seeking to cover. In the general run of domestic business inquiry is very light, notwithstanding the fact that a large proportion of first-half needs remain to be placed under contract. The revival of two large structural projects, which are expected to take approximately 20,000 tons of steel, with a possibility of their being closed in the near future, is taken to indicate a belief that the present level of high prices will continue longer than this work can be delayed. A substantial reduction in the price of galvanized sheets has been brought about and as low as 4.25c., Pittsburgh, has been done for heavier gages. In the pig iron market, aside from foreign inquiry, there is little or nothing to engage the attention of producers.

Pig Iron.—Although this market is perhaps the least favorably situated for the consideration of export business, except for shipment via New Orleans, the almost complete absence of domestic inquiry has turned attention almost exclusively in that direction. Some of the furnaces that rarely make Bessemer iron have been quoting with the expectation of turning their stacks to making as much such iron as they may be able to sell. Some sales of high-silicon foundry iron, for which there has been a demand from abroad, have been negotiated for shipment from the South. As for buying by local consumers, seldom has less business been under consideration, but prices for Northern iron have, as yet, shown no indication of weakening. Reports of the selling of Southern warrant iron at various prices between \$13 and \$14, at Birmingham, are continually appearing, but they compare with transactions known to have been made in this market at prices in no instance less than \$14, Birmingham. It seems likely that the discrepancy may be accounted for by differences in analysis. The agricultural implement interests have as yet shown no inclination to consider their further requirements, either of malleable or foundry iron. For Lake Superior charcoal iron we quote delivery prices at Chicago to include a freight rate of \$1.75. The following quotations are for iron delivered at consumers' yards, except those for Northern foundry, malleable Bessemer and basic iron, which are f.o.b. furnace and do not include a switching charge averaging 50c. per ton:

Lake Superior charcoal, Nos. 2 to 5.....	\$19.75
Lake Superior charcoal, No. 1.....	20.25
Lake Superior charcoal, No. 6 and Scotch....	20.75
Northern coke foundry, No. 1.....	19.50
Northern coke foundry, No. 2.....	19.00
Northern coke foundry, No. 3.....	18.50
Southern coke, No. 1 f'dry and 1 soft.....	\$18.50 to 19.00
Southern coke, No. 2 f'dry and 2 soft.....	18.50 to 19.00
Malleable Bessemer.....	19.50
Basic.....	19.00 to 19.50
Low phosphorus.....	34.00 to 36.00
Silvery, 8 per cent.....	31.50
Bessemer ferrosilicon, 10 per cent.....	33.50 to 35.50

Rails and Track Supplies.—The allotment of a portion of the recent Russian rail order to Chicago mills brings some 90,000 tons to be rolled here, and, in addition to the track fastenings for this particular part of the total order, all of the fastenings for the rails taken by the corporation on that order will be made in this

district. One specification calls for 750 tons of spikes. Inquiry for rails for Canada also totals a large figure, and, if such delivery as local mills can make is acceptable, that business is also likely to be placed in this market. The Harriman lines last week bought about 6000 tons of tie-plates, paying \$50 a ton, delivery to be made at mill convenience. Quotations are as follows: Standard railroad spikes, 2.75c., base; track bolts with square nuts, 3.25c. to 3.50c., base, all in carload lots, Chicago; tie-plates, \$50, f.o.b. mill, net ton; standard section, Bessemer rails, Chicago, \$33, base; open-hearth, \$35; light rails, 25 to 45 lb., \$40; 16 to 20 lb., \$41; 12 lb., \$42; 8 lb., \$43; angle bars, 2c., Chicago.

Structural Material.—A renewal of interest is reported in connection with the building of the Butler Brothers' warehouse, and also the proposed factory for James S. Kirk & Co., each expected to take about 10,000 tons. Both projects have been ready for placing for some time, but were indefinitely postponed because of high prices. The asking of tenders covering one of the viaducts to be built in connection with the new Union Depot terminal is expected within the next forty-five days. Of contracts reported placed last week, the American Bridge Company took 465 tons for Illinois Central railroad track elevation, 219 tons for Chicago & Western Indiana railroad bridges, 210 tons for the General Electric Company's Ft. Wayne factory, and 120 tons for a bridge at Gary, Ind. The Milwaukee Structural Steel Company will fabricate 150 tons for a church at Chicago. There is a little new car business, including 750 box cars placed by the Canadian Northern Railroad with the Haskell & Barker Car Company, and 1100 cars which the Milwaukee road has ordered built at its own shops. We quote for Chicago delivery of structural steel from mill, 2.689c.

We quote for Chicago delivery of structural steel from jobbers' stock 3.10c.

Wire Products.—The exceptional demand for plain wire, even as compared with other wire products for which there has been a large export demand, is reflected in the advance of \$4 a ton, made without corresponding change of prices in other forms of wire. The mills report some scattered orders for wire, but in general the situation is very quiet. We quote as follows: Plain wire, Nos. 6 to 9, base, \$2.839; wire nails, \$2.689; painted barb wire, \$2.839; galvanized barb wire, \$3.539; polished staples, \$2.839; galvanized staples, \$3.539; all Chicago.

Plates.—Participation in current business by the larger mills, where deliveries are desired in three or four months, is noted in several instances, but in each case the mills have quoted on the basis of working the new business in with similar orders, the rolling of which is scheduled within that period. One such sale of a few hundred tons of tank plate is noted at 3.25c., Pittsburgh, for delivery beginning in September. The quotation of 2.90c., Pittsburgh, for similar delivery, mentioned a week ago, appears to have been made in only one instance. The most common quotation for delivery up to 90 days is 3.50c., Pittsburgh, but 4c. appears to be obtainable for the very promptest shipment and for wide plates, of which business there is very little. We quote for Chicago delivery of plates from mill.

We quote for Chicago delivery of plates out of jobbers' stock, 3.50c.

Bars.—While the trade seems disposed to accept the fact that recently reported sales of implement bars at 2.35c. would establish the market for this material for first half delivery, no sales are quoted in the district at less than 2.50c., Pittsburgh. With respect to mild open-hearth bars, the market is undoubtedly stronger than in any other direction, but reports of easier deliveries are current here, as elsewhere. And some foundation is had in the sales of Bessemer bars and high-carbon open-hearth bars at 2.50c., Pittsburgh, for delivery in from two to six weeks. Quotations of standard open-hearth bars at 2.50c. for sixty days' delivery are reported, but lack substantiation. Rail-carbon steel is easier, but the open quotation continues at 2.50c., f.o.b. mill. Bar-iron conditions are unchanged. We quote, mill shipment, Chicago, as follows: Bar iron, 2.35c.;

soft steel bars, 2.689c. to 2.939c.; hard steel bars, 2.50c.; shafting, in carloads, 25 per cent off; less than carloads, 20 per cent off.

We quote store prices for Chicago delivery: Soft steel bars, 3.10c.; bar iron, 3.10c.; reinforcing bars, 3.10c. base with 5c. extra for twisting in sizes $\frac{1}{2}$ in. and over and usual card extras for smaller sizes; shafting 10 per cent off.

Sheets.—Prices for galvanized sheets are moving rapidly downward, but without result in increasing the volume of inquiry or specifications. Sales of heavy gage sheets are noted at prices as low as 4.25c., Pittsburgh, and lighter gages at 4.35c. and 4.40c. For black and blue annealed sheets, the leading interest is understood to be quoting 3.05c., Pittsburgh, as a minimum, but the market is quotable as low as 2.90c., with additional concessions for black sheets where quality is not subject to rigid specifications. We quote for Chicago delivery, blue annealed, No. 16 and heavier, 3.089c. to 3.339c.; box annealed, No. 17 and lighter, 2.939c. to 3.039c.; No. 28 galvanized, 4.439c. to 4.589c.

We quote for Chicago delivery of sheets out of stock, minimum prices applying on bundles of 25 or more, as follows: No. 16 blue annealed, 3.40c.; No. 28 black, 3.10c. to 3.20c.; No. 28 galvanized, 5c. to 5.10c.

Rivets and Bolts.—Local jobbers are making a stronger bid for bolt business, and at the relatively favorable prices quoted, mill quotations are suffering and mill sales are falling off. A similar situation obtains in the matter of rivets and makers' prices as quoted herewith are in a measure nominal except for contracts. We quote carriage bolts up to $\frac{3}{4}$ x 6 in., rolled thread, 50-10-5; cut thread, 50-5; larger sizes, 40-5; machine bolts up to $\frac{3}{4}$ x 4-in., rolled thread, with hot pressed square nuts, 50-10-10; cut thread, 50-10; larger sizes, 40-10-5; gimlet point coach screws, 60; hot pressed nuts, square, \$2.90 off per 100 lb.; hexagon, \$2.90 off. Structural rivets, $\frac{3}{4}$ to 1 $\frac{1}{4}$ in., 4c. to 4.15c., base, Chicago, in carload lots; boiler rivets, 10c. additional.

We quote out of store: Structural rivets, 3.50c.; boiler rivets, 3.60c.; machine bolts up to $\frac{3}{4}$ x 4 in., 60-10; larger sizes, 50-10; carriage bolts up to $\frac{3}{4}$ x 6 in., 60-5; larger sizes, 50 off; hot pressed nuts, square, \$3.25, and hexagon, \$3.25 off per 100 lb.; lag screws, 65.

Old Material.—Following the temporary, and in a degree artificial, strengthening of prices which attended the buying of steel scrap by the Steel Corporation, the market is again apathetic. Trading is limited to the small lots with which consumers are filling in their stocks, but there is little or no buying, even for short future periods. Prices have changed scarcely at all since last reported. The Illinois Central Railroad sold 1800 tons of scrap last week and other offers include 2700 tons from the Michigan Central, 2900 tons from the Great Northern and 500 tons from the Chicago & Alton. We quote for delivery at buyers' works, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton	
Old iron rails	\$18.50 to \$19.00
Relaying rails	19.50 to 20.50
Old carwheels	12.00 to 12.25
Old steel rails, rerolling	15.25 to 15.50
Old steel rails, less than 3 ft.	15.00 to 15.25
Heavy melting steel scrap	14.25 to 14.50
Frogs, switching and guards, cut apart	14.25 to 14.50
Shoveling steel	13.75 to 14.25
Steel axle turnings	9.25 to 9.75

Per Net Ton	
Iron angles and splice bars	\$18.25 to \$18.75
Iron arch bars and transoms	19.50 to 20.00
Steel angle bars	13.50 to 14.00
Iron car axles	25.50 to 26.25
Steel car axles	25.75 to 26.25
No. 1 railroad wrought	15.00 to 15.50
No. 2 railroad wrought	14.00 to 14.25
Cut forge	14.00 to 14.25
Pipes and flues	10.75 to 11.00
No. 1 busheling	12.00 to 12.50
No. 2 busheling	8.50 to 9.00
Steel knuckles and couplers	13.50 to 14.00
Steel springs	14.00 to 14.50
No. 1 boilers, cut to sheets and rings	9.25 to 9.75
Boiler punchings	13.50 to 14.00
Locomotive tires, smooth	20.00 to 20.50
Machine shop turnings	5.50 to 6.00
Cast borings	5.75 to 6.25
No. 1 cast scrap	11.50 to 12.00
Stove plate and light cast scrap	9.25 to 9.75
Grate bars	10.00 to 10.25
Brake shoes	9.75 to 10.25
Railroad malleable	11.75 to 12.25
Agricultural malleable	10.75 to 11.25

Cast Iron Pipe.—Pipe business continues very light, particularly from municipal sources. The American Cast Iron Pipe Company has taken 200 tons at Springfield, Ohio; James B. Clow & Son, a small order at Michigan City, Ind., and the leading interest 130 tons of special pipe at St. Louis. Specifications against contracts are fair and there is a scattering of railroad business. We quote as follows, per net ton, Chicago: Water pipe, 4-in., \$33.50 to \$34; 6-in. and larger, \$30.50 to \$31, with \$1 extra for class A water pipe and gas pipe.

Philadelphia

PHILADELPHIA, PA., July 18, 1916.

In all lines, new business continues to show a tendency toward quiet, which might cause uneasiness were the makers not so well filled with orders. Most of them could use more labor were it obtainable. As matters are, several large producers of steel products are glad of the opportunity to shorten their deliveries, as they have steadily held that it is not wise to sell too far ahead. The prices of some steel products, notably those for structural shapes, are being disturbed by offerings under mill prices by jobbers. Export inquiry for plates continues heavy, but not all the mills will consider it. The export demand is greater for Bessemer and low-phosphorus pig iron. Export shipments of pig iron, combined with the great consumption here, are expected by producers to carry the market through the midsummer quiet. Old material is very dull, with embargoes still affecting some important points. Ferromanganese is arriving freely from Great Britain and is easier.

Pig Iron.—The one feature continues to be the export call for Bessemer and low-phosphorus. Of the latter, several thousand tons have been placed, including 2000 tons for Italy and 1000 tons for Canada. Domestic consumers have also taken about 4000 tons of this grade. Low phosphorus for export is quoted at \$34 to \$35, Philadelphia. Basic has been quiet since two eastern Pennsylvania steel companies took round lots at \$19, delivered, a price on which sellers have commented with some disappointment. A lot of 500 tons was sold at the same price to a small interest near Chester, Pa., in the past week. Foundry iron inquiry and sales are limited to small lots needed to fill in or maintain mixtures, and of this sort of demand there is hardly enough to establish a market. The trade is still basing its hope for the future on the heavy production of steel, which may help foundry iron producers indirectly, as some capacity is being turned from the production of foundry grades to Bessemer. Meanwhile, the larger producers of foundry iron are well sold beyond the present quarter. Quotations for standard brands, delivered in buyers' yards, prompt shipment, range about as follows:

Eastern Pa., No. 2 X foundry	\$19.75 to \$20.25
Eastern Pa., No. 2 plain	19.50 to 20.00
Virginia, No. 2 X foundry	21.25
Virginia, No. 2 plain	20.75
Gray forge	18.50 to 19.00
Basic	19.00 to 19.50
Standard low phosphorus	33.00 to 34.00

Ferroalloys.—Except for two or three small inquiries, the market is inactive, with both foreign and domestic 80 per cent ferromanganese quoted at \$175, seaboard, prompt delivery. Prompt spiegeleisen is obtainable at \$50, furnace. In the week ended July 15, arrivals of English ferromanganese at this port aggregated 1129 tons. Recent arrivals have been liberal in quantity. Another arrival of the week consisted of 500 lb. of ferrotantalum from England. Contract ferrosilicon, 50 per cent, is unchanged at \$83 to \$85, Pittsburgh, and 11 per cent at \$35.44.

Iron Ore.—In the week ended July 15 the arrival of 11,324 tons from Sweden was reported.

Plates.—Export inquiries are more numerous, but some makers take the stand that their first duty is to care for domestic consumers, and they are not selling for export. Plates are wanted for export to England, Italy, China and Japan, mostly for shipbuilding. Quo-

tations continue to range from 3.659c. to 4.159c., Philadelphia. To a limited degree fairly prompt shipments can be made, even at the lower price, though the sizes are restricted. The mills quoting the higher price stipulated that deliveries must be at their convenience, or in about five to seven months. For 1917 delivery one maker quotes 3.25c., Pittsburgh, or 3.409c., Philadelphia.

Bars.—Bessemer steel bars can be had at 2.659c., Philadelphia, delivery in two or three months, and more promptly in some cases. A mill that will sell Bessemer stock at this price quotes 3.409c., Philadelphia, and over for open-hearth bars. Iron bars are unchanged at 2.659c., Philadelphia, with a continued good demand.

Structural Material.—The market is admitted on all sides to be quiet so far as new business goes. Since July 1, when consumers' contracts became effective at higher prices, a disinclination to specify has become apparent while a further feature is the extent to which certain jobbers are underselling the mills, offering material which was contracted for at considerably lower levels than now prevail. Ordinarily this situation would be read to mean a weaker market, but mills are understood to be maintaining prices. An eastern Pennsylvania maker quotes 3.159c., Philadelphia, for the most part, though on large business it would accept 2.909c. Another maker has named the latter price on Bessemer shapes, but asks up to 3.659c. for open-hearth material, delivery in 30 to 60 days. Threatened labor trouble in this district has been at least partly adjusted. Some small lots of shapes required by a Canadian shipyard have been offered to mills unsuccessfully, partly because of the prompt delivery required, also because they must conform with Lloyd's specifications. These require the presence of an inspector when the shapes are rolled. The Eastern Steel Company will supply 300 tons for the construction of a building for the Carpenter Steel Company, Reading, Pa.

Billets.—The demand is good, in that contracts are being freely specified against, while considerable new inquiry is before the makers. The quotation for open-hearth rerolling billets is at about \$45, and that for forging steel about \$65.

Sheets.—For No. 10 blue annealed sheets, 3.659c., Philadelphia, is quoted for third quarter delivery, but this price is susceptible of shading on contracts.

Coke.—The market is quiet, and the producers are looking for business. Spot furnace is quoted at about \$3.75 per net ton at furnace, and contract at \$2.50, with a probability that lower than the latter price might be done. Spot and contract foundry both range from \$3.25 to \$3.50 per net ton at oven. Freight rates from the principal producing districts follow: Connellsville, \$2.05; Latrobe, \$1.85, and Mountain, \$1.65.

Old Material.—The only activity reported is in steel axles for export. The railroad freight embargoes are still effective at Burnham and Coatesville, Pa., but are expected to be lifted at the latter place very soon. Quotations for delivery in buyers' yards in this district, covering eastern Pennsylvania, and taking freight rates from 35c. to \$1.35 per gross ton, are as follows:

No. 1 heavy melting steel.....	\$15.00 to \$15.50
Old steel rails, rerolling.....	17.00 to 18.00
Low phos. heavy melting steel scrap	20.50 to 21.50
Old steel axles	26.00 to 27.00
Old iron axles	28.00 to 29.00
Old iron rails	20.00 to 20.50
Old carwheels	15.00 to 15.50
No. 1 railroad wrought.....	19.50 to 20.00
Wrought-iron pipe	12.50 to 13.00
No. 1 forge fire	13.00 to 13.50
Bundled sheets	13.00 to 13.50
No. 2 busheling	10.50 to 11.00
Machine shop turnings	8.50 to 9.00
Cast borings	10.00 to 10.50
No. 1 cast	16.00 to 16.50
Grate bars, railroad.....	11.75 to 12.25
Stove plate	11.75 to 12.25
Railroad malleable	13.50 to 14.00

The Carnegie Steel Company is to use pulverized coal in connection with open-hearth furnaces. It has placed an order for 17 pulverizing mills with the Raymond Brothers Impact Pulverizer Company, Chicago.

Cleveland

CLEVELAND, OHIO, July 18, 1916.

Iron Ore.—Reports from the Mesaba Range indicate a further improvement in the strike situation. Several of the underground mines have resumed operations. Various estimates are made of the number of men who have left the district since the strike started, and it is evident that even if all who have remained in the district return to work there will be a labor shortage during the remainder of the season. Shipments continue heavy, being affected little by the strike. We quote ore prices as follows, delivered lower lake ports: Old-range Bessemer, \$4.45; Mesaba Bessemer, \$4.20; old-range non-Bessemer, \$3.70; Mesaba non-Bessemer, \$3.55.

Pig Iron.—The market is unusually dull. A northern Ohio consumer has taken 500 tons of foundry iron from a Cleveland furnace at \$18.50 for No. 2, for last half, and a few sales in smaller lots are reported. Few foundries are being operated at full capacity because of the scarcity of labor, and most consumers are under contract for their full requirements for the remainder of the year. A few small-lot sales of Southern foundry iron are reported for third and fourth quarter delivery at \$14, Birmingham, for No. 2. Some of the furnaces are asking \$14.50 for this delivery. The quotation for the first half is unchanged at \$14.50 to \$15. We quote, delivered Cleveland, as follows:

Bessemer	\$21.95
Basic	18.95
Northern No. 2 foundry.....	\$18.70 to 18.80
Southern No. 2 foundry.....	18.00 to 18.50
Gray forge	18.50
Jackson County silvery, 8 per cent	
silicon	28.63 to 30.62
Standard low phos., Valley furnace.....	32.00

Coke.—Shipments are good, but there is little new demand. Deliveries of furnace coke, which has been scarce, are somewhat easier. We quote standard Connellsville foundry coke at \$3 to \$3.25, per net ton at oven, for prompt shipment, and \$3.25 to \$3.50 for contracts. Connellsville furnace coke is held at \$2.75 for prompt shipment.

Bolts, Nuts and Rivets.—Bolt and nut specifications have fallen off somewhat this month, due probably to the heavy volume of orders in June on expiring first-half contracts. Manufacturers' prices are firm, but there is some shading by jobbers for prompt delivery. Rivet specifications are fair, but not much new business is coming out, as consumers are mostly under contract. We quote rivets at 4c., Pittsburgh, for structural and 4.10c. for boiler rivets. Bolt and nut discounts are as follows:

Common carriage bolts, $\frac{3}{4}$ x 6 in., smaller or shorter, rolled thread, 50 and 10; cut thread, 50; larger or longer, 40; machine bolts with h. p. nuts, $\frac{3}{4}$ x 4 in., smaller and shorter, rolled thread, 50, 10 and 5; cut thread, 50 and 5; larger and longer, 40 and 10; lag bolts, gimlet or cone point, 50 and 10; square h. p. nuts, blank or tapped, \$2.90 off the list; hexagon, h. p. nuts, blank or tapped, \$2.90 off; c. p. c. and t. sq. nuts, blank or tapped, \$2.60; hexagon nuts, all sizes, \$3 off; cold pressed semi-finished hexagon nuts, all sizes, 60 and 10.

Finished Iron and Steel.—New demand is slightly more active, both for early shipment and for future delivery. Considerable business is being placed in Bessemer steel bars for prompt shipment, orders during the week including one from an Ohio manufacturer for 2000 tons. Some last-half contracts for steel bars and structural material are being placed at 2.50c., Pittsburgh, and one independent mill has opened its books for the first quarter of next year at 2.50c. for steel bars and 2.90c. for plates. Although sales of considerable amounts of steel bars to the implement trade are reported at 2.35c., Pittsburgh, local mill agencies have not been authorized to quote less than 2.50c. to this trade. There is considerable inquiry for billets and sheet bars for export, and some of the Ohio mills are trying to stock additional tonnage of sheet bars for third quarter, but the supply is quite limited. The structural situation is very quiet. There is a great deal of inquiry for contract rods, wire and nails. Bar iron is unchanged at 2.50c., Cleveland. Inquiry for sheets for third and fourth quarter is heavy, and considerable business is being placed for black and blue annealed sheets in the

heavier gages. Prices on galvanized sheets are slightly easier. We quote black sheets at 2.90c. to 3c., Ohio mill, for No. 28; blue annealed at 3c. to 3.10c. for No. 10; galvanized at 4.35c. to 4.40c. for No. 28. The volume of warehouse business, which has been quiet for several weeks, has again become heavy. We quote warehouse prices at 3.25c. for steel bars and structural material, 3.65c. for plates and 3.20c. for iron bars.

Old Material.—Sentiment has improved and a fair volume of business is being placed for steel-making scrap. Other grades are quiet, although there is a better demand for cast scrap, which has been inactive for some time. Dealers generally are not inclined to sell much material for future delivery at present prices. Slightly higher prices are being quoted for heavy melting steel, borings, busheling, car wheels and grate bars. We quote, f.o.b. Cleveland, as follows:

Per Gross Ton	
Steel rails	\$14.75 to \$15.00
Iron rails	18.50 to 19.00
Steel car axles	28.00 to 29.00
Heavy melting steel	15.00 to 15.25
Car wheels	12.75 to 13.00
Relaying rails, 50 lb. and over	22.50
Agricultural malleable	12.50 to 12.75
Railroad malleable	14.00 to 14.25
Steel axle turnings	12.00 to 12.25
Light bundled sheet scrap	12.00 to 12.25

Per Net Ton	
Iron car axles	\$23.00 to \$24.00
Cast borings	6.00 to 6.25
Iron and steel turnings and drillings	5.75 to 6.00
No. 1 busheling	11.75 to 12.00
No. 1 railroad wrought (nominal)	15.00 to 15.50
No. 1 cast	14.00 to 14.25
Railroad grate bars	10.00 to 10.50
Stove plate	10.00 to 10.25

Cincinnati

CINCINNATI, OHIO, July 19, 1916—(By Telegraph).

Pig Iron.—Circulated reports of large export sales have sentimentally helped the Southern market, but there are no changes in prices, and \$14, Birmingham basis, can be done for this year's shipment on both resale and some furnace iron, but most makers are asking from \$14.50 to \$15, which also represent their quotations for the first half of 1917. A sale of 400 tons of Southern iron for July-August shipment was made in St. Louis territory, but business in this vicinity was confined to very small lots. Only a comparatively few consumers have neglected to close for this year's requirements, and at the present time they are indifferent as to contracting into next year. The Northern furnaces are holding foundry, malleable and basic, at \$19, Iron-ton, for any shipment until July 1, 1917, but have lately closed no business of note at this quotation. Some complaint is noted of shipments of foundry iron being held up, which is attributed to the decreased consumption on account of labor shortage in the hot weather. A general inquiry is out for approximately 700 tons of Bessemer ferrosilicon for a West Virginia consumer. As a rule, sellers are not now trying to force the market, and have adopted the same waiting attitude assumed by buyers. Based on freight rates of \$2.90 from Birmingham, and \$1.26 from Iron-ton, we quote, f.o.b., Cincinnati, as follows:

Southern coke, No. 1 f'dry and 1 soft	\$17.40 to \$18.40
Southern coke, No. 2 f'dry and 2 soft	16.90 to 17.90
Southern coke, No. 3 foundry	16.40 to 17.40
Southern coke, No. 4 foundry	15.90 to 16.90
Southern gray forge	15.40 to 16.40
Ohio silvery, 8 per cent silicon	28.26 to 28.76
Southern Ohio coke, No. 1	20.76 to 21.26
Southern Ohio coke, No. 2	19.76 to 20.26
Southern Ohio coke, No. 3	19.26 to 19.76
Southern Ohio malleable Bessemer	19.76 to 20.26
Basic, Northern	19.76 to 20.26
Lake Superior charcoal	21.20 to 22.20
Standard Southern carwheel	24.90 to 25.40

(By Mail)

Finished Material.—Quotations on galvanized sheets are somewhat disturbed at the present time, due to fluctuations in prices on spelter. The near-by mills are only willing to take on business to fill customers' urgent requirements, and are not soliciting any large and long-time contracts. To-day's minimum quotation on No. 28 galvanized sheets is 4.50c., f.o.b., Cincinnati or Newport, Ky., and 2.90c. on No. 28 black sheets. The following are jobbers' prices, that have not been

changed in the past three weeks: No. 10 blue annealed sheets at 3.50c.; steel bars and small structural shapes, 3.20c.; wire nails, \$2.75 per keg base; barb wire, \$3.60 per 100 lb.; plates, 3.50c.; smaller sizes machine bolts, 60 per cent off list; larger sizes, 40 and 10 and 5 per cent off list; hot presses square and hexagon nuts, 2.70c. off list; malleable washers, 5½c. per lb.; cast-iron washers, 3c. per lb.; and cold-rolled rounds, 10 per cent plus list. More business for hoops and bands could be obtained if shipments could be made to meet the wishes of consumers.

Coke.—Business is still very dull, and only a few contracts for foundry coke are being made in this territory. A small amount of furnace coke for domestic use is contracted for from time to time, but the total tonnage is hardly worthy of mention. The consumption of foundry coke has been cut down to some extent on account of the hot weather, although shipments have been going forward at about the usual rate. We quote Connellsville furnace coke around \$2.25 to \$2.50 per net ton at oven, with approximately 10c. a ton added for contract business. Foundry coke is unchanged at \$3.25 to \$3.75 in the Connellsville, Wise County, and Pocahontas fields, and New River foundry coke is held around \$4 at oven.

Old Material.—Prices on all grades are still soft, and quotations from different dealers vary to a larger extent than for a long time, so that it is difficult to arrive at general averages. Cast borings and steel turnings still seem to be a drug on the market, and there are no staple buying or selling prices on these two grades. The following are dealers' prices to consumers, f.o.b. at yards, southern Ohio and Cincinnati:

Per Gross Ton	
Bundled sheet scrap	\$11.25 to \$11.75
Old iron rails	15.50 to 16.00
Relaying rails, 50 lb. and up	21.00 to 21.50
Rerolling steel rails	14.50 to 15.00
Heavy melting steel scrap	14.00 to 14.50
Steel rails for melting	13.00 to 13.50

Per Net Ton	
No. 1 railroad wrought	\$13.25 to \$13.75
Cast borings	4.75 to 5.25
Steel turnings	5.25 to 5.75
Railroad cast scrap	11.00 to 11.50
No. 1 machinery cast scrap	12.75 to 13.25
Burnt scrap	8.25 to 8.75
Iron axles	21.00 to 22.00
Locomotive tires (smooth inside)	19.50 to 20.00
Pipes and flues	9.50 to 10.00
Malleable and steel scrap	10.75 to 11.25
Railroad tank and sheet scrap	8.50 to 9.00

Buffalo

BUFFALO, N. Y., July 17, 1916.

Pig Iron.—The improvement in inquiry noted last week, and which appears to have been but temporary, has subsided. The bulk of the tonnage inquired for has evidently gone to furnaces outside of the Buffalo district more eager for orders. Buffalo interests are in a fairly strong position as regards sold-up conditions and orders, and are not inclined to reduce quotations to meet outside competition. We quote as follows for last half delivery, f.o.b. furnace, Buffalo:

No. 1 foundry	\$19.00 to \$19.25
No. 2 X foundry	18.50 to 19.00
No. 2 plain	18.50 to 18.75
No. 3 foundry	18.50 to 18.75
Gray forge	18.25 to 18.50
Malleable	18.50 to 19.00
Basic	19.50 to 20.00
Bessemer	21.00 to 22.00
Charcoal, regular brands and analysis	21.00 to 22.00

Finished Iron and Steel.—Aside from a few inquiries from Canadian agricultural implement makers, which have not yet taken definite shape, the market has been bare of interest, current orders being very light. There are no evidences in this market of concession prices for agricultural implement bars. Some large contract customers are making insistent endeavor to get in larger contracts on order books for next year, but mills are not willing to take on increased allotments on forward orders. Bids are soon to be taken for about 120 tons of reinforcing bars, and also for considerable structural steel for the Niagara Alkali Company's factory at Niagara Falls, N. Y. The John W. Cowper Company, Buffalo, has been awarded the general contract for the

erection of a new building for the Bank of Buffalo, 400 tons. The Buffalo Structural Steel Company has taken 250 tons for the foundry extension for the Pratt & Letchworth Company, Buffalo; 100 tons for plant extensions of the Excelsior Steel Ball Company, Buffalo, and 100 tons for the Delaware Avenue residence for Mrs. Seymour H. Knox.

Old Material.—The market continues to show practically as firm a tone as a week ago. The stiffening effect of the buying movement in heavy melting steel remains, but is not of sufficient force to change schedules. Generally, the list is somewhat firmer. We quote dealers' asking prices, per gross ton, f.o.b. Buffalo, as follows:

Heavy melting steel	\$15.50 to \$16.00
Low phosphorus steel	20.00 to 20.50
No. 1 railroad wrought scrap	17.25 to 17.75
No. 1 railroad and machinery cast scrap	15.50 to 16.00
Steel axles	24.00 to 24.50
Iron axles	24.00 to 24.50
Carwheels	13.00 to 13.50
Railroad malleable	15.00 to 15.50
Machine shop turnings	6.25 to 6.75
Heavy axle turnings	12.00
Clean cast borings	7.25 to 7.75
Iron rails	18.00 to 18.50
Locomotive grate bars	11.50 to 12.00
Stove plate (net ton)	11.00 to 11.50
Wrought pipe	12.00 to 12.50
Bundled sheet scrap	11.50 to 12.00
No. 1 busheling	13.00 to 13.50
No. 2 busheling	11.00 to 11.50
Bundled tin scrap	15.00 to 15.50

St. Louis

ST. LOUIS, Mo., July 17, 1916.

Pig Iron.—The only transaction of consequence during the week was 400 tons of No. 2 Southern, the price not being made public. Indications are that it was very close to \$14 per ton. Furnace representatives, however, continue to hold their prices at the old figures, declining to recognize the quotations resulting from resale iron. The Mississippi Valley Iron Company's furnace has not been lighted because the ore, which is coming from the Mesaba range, is not moving forward in sufficient quantities.

Old Material.—A better tone is noted, especially in steel products, which are firmer and in some cases higher. No large buying was reported, but enough was done to confirm the optimism of most sellers in holding for better figures than have been prevailing. Lists out during the week included: Chicago & Alton, 500 tons; Great Northern, 3000 tons; St. Joseph & Grand Island, 2000 tons; Vandalia, 1000 tons. Relayers continue very firm, particularly light rails, and hard to get. We quote dealers' prices, f.o.b., customers' works, St. Louis industrial district, as follows:

Per Gross Ton	
Old iron rails	\$15.75 to \$16.25
Old steel rails, rerolling	15.25 to 15.50
Old steel rails, less than 3 ft.	16.00 to 16.25
Relaying rails, standard section, subject to inspection	22.00 to 23.00
Old carwheels	11.50 to 11.75
No. 1 railroad heavy melting steel scrap	14.25 to 14.50
Heavy shoveling steel	12.25 to 12.50
Frogs, switches and guards cut apart ..	14.25 to 14.50
Bundled sheet scrap	8.00 to 8.50

Per Net Ton	
Iron angle bars	\$15.25 to \$15.75
Steel angle bars	13.00 to 13.25
Iron car axles	22.00 to 22.50
Steel car axles	25.00 to 25.50
Wrought arch bars and transoms	18.50 to 19.00
No. 1 railroad wrought	14.00 to 14.50
No. 2 railroad wrought	13.75 to 14.25
Railroad springs	13.50 to 13.75
Steel couplers and knuckles	13.50 to 13.75
Locomotive tires, 42 in. and over, smooth inside	19.25 to 19.50
No. 1 dealers' forge	10.25 to 10.75
Cast iron borings	5.75 to 6.25
No. 1 busheling	11.50 to 12.00
No. 1 boilers, cut to sheets and rings ..	8.25 to 8.50
No. 1 railroad cast scrap	10.75 to 11.00
Stove plate and light cast scrap	8.25 to 8.75
Railroad malleable	10.50 to 11.00
Agricultural malleable	9.50 to 10.00
Pipes and flues	9.50 to 10.00
Railroad sheet and tank scrap	9.00 to 9.50
Railroad grate bars	8.50 to 8.75
Machine shop turnings	6.75 to 7.25

Coke.—Aside from the closing of the annual contract for the needs of the St. Joe Lead Company's smelter, transactions in coke were on small lots, establishing no market quotation. The contract of the St.

Joe company aggregated something in excess of 30,000 tons and was all for by-product coke, part going to the local gas company and part to outside by-product plants, including the plant under construction at Terre Haute, Ind., which will begin delivery about Oct. 1. The price was withheld.

Finished Iron and Steel.—Some strengthening of specifications is noted, but no new business of consequence has appeared, though the aggregate of new orders was quite satisfactory. Movement out of warehouse continues very active and the only price change of consequence is that on galvanized plates caused by the easier spelter market. We quote for stock out of warehouse as follows: Soft steel bars, 3.15c.; iron bars, 3.05c. to 3.10c.; structural material, 3.15c.; tank plates, 3.55c.; No. 10 blue annealed sheets, 3.45c.; No. 28 black sheets, cold rolled, one pass, 3.20c. to 3.30c.; No. 28 galvanized sheets, black sheet gage, 5c. to 5.10c.

Birmingham

BIRMINGHAM, ALA., July 17, 1916.

Pig Iron.—The market is still without a price basis. There have been inquiries for lots of from 250 tons up to 2000 tons, but quotations, which the makers say have been on a basis of \$15 furnace, appear to have failed to get business. Consumers have not offered, for large tonnages, under \$15. In fact, there have been no firm offers at any figure. Resale metal having had its day, the confusing of warrant prices with those of f. o. b. furnaces will probably cease. Bookings have been for small lots and \$15, furnace, is still obtained, but \$14.50 could be done on a large tonnage. Makers are inclined to believe that active buying is several weeks off. Prompt shipment remains the custom rather than otherwise. The iron is going out as ordered, but large consumers in several instances still have stocks of metal purchased months ago and some of that bought at low prices has not yet been used up. The output for July will be considerably curtailed owing to trouble with furnaces, mines and quarries incident to the unexampled rainfall from July 5 to 11. During the past week there was a movement of 8000 tons of spot iron for export out of the ports of Charleston, Savannah and New Orleans, delivery being principally in the Mediterranean. Ocean freight rates, lower than they have been, were obtained and that they were secured in three different ports at the same time has served to encourage prospect of further export business. The last open ocean rate quotation was \$27 per ton. Yard stocks have increased only 25,000 tons since March 1, although manufacture has been steadily breaking records by 40 per cent. That only 6000 tons additional went to the yards during June is taken as indication that the consumer needs the metal. We quote per gross ton, f. o. b. Birmingham district furnaces, as follows:

No. 1 foundry and soft	\$15.00 to \$15.50
No. 2 foundry and soft	14.50 to 15.00
No. 3 foundry	14.00 to 14.50
No. 4 foundry	13.75 to 14.25
Gray forge	13.50 to 14.00
Basic	14.50 to 15.00
Charcoal	22.00 to 22.50

Cast-Iron Pipe.—Several export inquiries are under consideration by the Birmingham water pipe manufacturers and they expect to get the orders. New business in small lots both from the south and the middle west has aggregated a good volume. The disposition to go slowly in contracting for forward delivery is still manifested by municipalities. Prices are unchanged, and we quote per net ton, f. o. b. pipe shop yards, as follows: 4-in., \$28; 6-in. and upwards, \$25 with \$1 added for gas pipe and 16-ft. lengths.

Coal and Coke.—Standard foundry coke is scarce. Makers could sell more if they had it. The price is strong at \$4.25 to \$4.50 per ton. Furnace coke rules at \$3.25 to \$3.50. Independent coal mines have experienced a recent demand from furnace companies, whose mines were flooded. The Republic Iron & Steel Company was forced to close down at Palos on account of high water and to get coal elsewhere. On the other hand, the independent mines were for the most part

equal sufferers. Prices obtained on recent contracts rule higher than last year, when they were remarkably low. It will take some time to recover from the effects of high water.

Old Material.—Belief that prices will not go lower has been strengthened by the firmness of recent quotations. They are low, but they now appear to mark the bottom, and indications point to an early tendency to improvement. Consumers' stocks are working lower. We quote per gross ton, f. o. b. Birmingham dealers' yards, as follows:

Old steel axles	\$22.00 to \$23.00
Old steel rails	10.00 to 10.50
No. 1 steel scrap	9.25 to 9.75
No. 1 wrought scrap	12.50 to 13.00
No. 1 cast scrap	10.50 to 11.00
Extra heavy cast scrap	9.50 to 10.00
Stove plate and light	9.00 to 9.50
Old carwheels	9.50 to 10.00
Tram carwheels	9.50 to 10.00

San Francisco

SAN FRANCISCO, CAL., July 11, 1916.

The local trade remains quiet as regards new business. The tonnage moving on old contracts is still heavy, and specifications show little if any decrease. While the complaint of shortage of supplies is less general, material available for early delivery is apparently about as firm as ever, and prices from store are fully maintained. Routine requirements in some quarters are hardly up to expectations, but the general distributive movement is satisfactory, while the demand for special purposes is well maintained. Labor disturbances cause some apprehension, as the waterfront strike is as bad as ever, some of the automobile machinists are still out, and the structural iron workers went out this week, demanding an 8-hr. day.

Bars.—Reinforced-concrete is being used for building more extensively than usual, and a number of substantial orders for reinforcing bars have been placed in the last few weeks, a good share going to local mills, and conditions apparently favor an increase. The general country and coastwise trade is slow, but mining interests are constantly in the market, and liberal specifications continue to come from many manufacturers, most of whom have contracts extending for several months in the future. The jobbing price on small lots is 4c., and mills quote 3.50c. for prompt, or 3c. for extended delivery in large lots to the trade.

Structural Material.—Up to this week local shops have been very busy, and they still have a substantial tonnage on their books, but the labor situation causes some uncertainty. New business has been coming out more freely lately, and builders in many cases seem less disposed to hold off, although some plans have been changed to reinforced concrete. Recent lettings include several factory jobs of some importance; and the largest job now being figured is the Portland, Ore., post office, about 2000 tons. A large bridge in Sonoma County, Cal., is also up. A general contract has been let for a nine-story bank at Stockton, Cal. Plans are expected shortly for a number of State buildings at various points.

Plates.—Shipbuilding firms in this district are apparently unable to take any more steel ship contracts for some time to come. Most of the work in hand is covered by contracts, on which deliveries are coming in fairly well, though there is still occasional buying from store to cover shortages. Important tank and pipe inquiries continue to appear. The Lindsay-Stratmore irrigation system has just taken figures on a lot of riveted pipe. The general demand from small shops is fairly active, but current arrivals cover routine needs fairly well. The local jobbing price on small lots is steadily held at 4.75c.

Sheets.—Buying of galvanized sheets has been very conservative, and the present easiness tends to augment the feeling of caution. The consuming demand is light in most lines, though there is a fair movement for special purposes. Black sheets are quiet, though less so than might be expected at this season. The movement of blue annealed on contracts continues

heavy, and there is some new inquiry, with few mill agents in a position to take additional business.

Wrought Pipe.—Bookings by mill representatives in the last few weeks have been disappointing, especially in the oil fields, where the new development from which much was expected is found to be limited to a few large companies. In merchant pipe, jobbing stocks are not yet moving out as rapidly as could be wished and little replenishment is required.

Cast-Iron Pipe.—With prospects of a \$2 per ton advance in freight Sept. 1, and nothing to indicate a recession of foundry prices, many consumers are disposed to anticipate requirements, and small orders are quite numerous. No new important municipal inquiries have appeared in the last fortnight, however, and no great tonnage from such sources is in sight. The town of Lovelock, Nev., will shortly take alternate bids for a lot of cast-iron or steel pipe. Woodland, Cal., has sold a \$71,000 bond issue for waterworks.

Pig Iron.—With liberal arrivals on old contracts, new business is rather quiet, either for prompt or extended shipment. Some additional contracting is expected before long, but the principal requirements are believed to be covered through the remainder of the year. The quantity melted continues unusually heavy. Most local agents are holding rather steadily to a quotation of \$26 per gross ton for No. 1 Southern foundry iron.

Coke.—Current requirements are well covered by arrivals on old contracts, and little new business in foundry coke has been closed for some time. Prices show a wide range. Offerings from some Southern points are available around \$15 per net ton, while some buyers demand special brands of Virginia coke, which is held here at \$17 to \$17.50.

Ferroalloys.—Shipments of ferromanganese are coming through well, and supplies are ample for local needs. The price is easier, being quoted here at about \$212. The output in California is increasing, but so far most of it is going East. Ferrosilicon has stiffened up again, being now held at \$105 in carload lots, or \$125 in smaller sales.

Old Material.—New business in steel melting scrap is somewhat less active than for some time past, as practically all the melters have bought a heavy tonnage, and this is now being shipped in as required. Prices for the various grades of steel scrap range from \$8 to \$12 per gross ton. Cast-iron scrap is moving freely, and while there is considerable available, values are fairly well maintained at \$16 to \$18 per net ton.

New York

NEW YORK, July 19, 1916.

Pig Iron.—The local market can be very briefly reviewed, for there has been little to it in the past week. Buyers seem to take the view that they will get lower prices by waiting. Meantime, the effect of foreign business is being closely watched by both producers and consumers. Southern resale iron apparently has been pretty well taken up. At some blast furnaces labor conditions seem to be slightly improved. Here and there a shortage of labor for loading cars has been reported. The New Haven Railroad enforced a pig-iron embargo in the week ending July 12, but shipments are now freely made. One Crane stack at Catasauqua, Pa., has gone out for relining. We quote at tidewater for early delivery: No. 1 foundry, \$20.50 to \$21; No. 2X, \$19.75 to \$20.25; No. 2 plain, \$19.50 to \$20; Southern iron at tidewater, \$20 to \$20.50 for No. 1 and \$19.50 to \$20 for No. 2 foundry and No. 2 soft.

Ferroalloys.—Specifications on contracts for ferromanganese are very strong and consumers are freely taking all that they can get. Deliveries from England are increasing with each month and those for June will probably exceed any previous month in two years when official data are all reported. One broker states that his principals in England cable him that 5000 tons are in transit or about to be shipped to this country. Inquiries are exceedingly scarce and new buying is at a low ebb, consumers being apparently well covered.

Standard ferromanganese can be obtained for any delivery now at \$175, seaboard. A sale of 500 tons to Italy is noted and there are several inquiries from foreign consumers. Spiegeleisen is quiet at \$50 to \$55, furnace. Foreign inquiries total 1000 to 1200 tons. Ferrosilicon is strong at \$90 to \$100 for early delivery. A strike at the plant of the largest domestic producer is causing some anxiety among consumers, and inquiries are in the market from users whose shipments are thus cut off. Ferrosilicon, 10 to 12 per cent, is quoted at \$28 to \$30, furnace, and the demand is strong.

Structural Material.—Little hope is expressed that much of the numerous building projects in New York territory will be settled until plain material, and doubtless other building materials also, are lower in price. Such a contingency is not yet regarded as likely before the last weeks of the year. Then scarcity of orders with structural mills not attached to other steel rolling plants might, it is thought, result in concessions in price with fairly prompt delivery, but the general continued strength in both semi-finished and finished steel, it is believed, will act to prevent at that time any marked differences in price. Meanwhile aside from industrial plant extension work, not much is regarded as urgent except operations of speculative builders, who must keep the wheels of their organizations going. The floods in the South will of course demand bridge replacement of some magnitude in the aggregate. The fresh bridge offerings independent of this emergency work include 500 tons for three bridges for the Baltimore & Ohio; about 200 tons for the Boston & Maine and 500 tons for a highway over the Susquehanna. Among the new active jobs may be mentioned two apartment houses for the Edgar A. Levy Construction Company, one at Seventy-eighth Street and Park Avenue and the other at 140 West Fifty-eighth Street, and each involving 500 tons; 3000 to 4000 tons at Toledo for the La Salle-Koch department store; 600 tons for an addition to the Harrington Hotel, Washington, D. C.; 1200 tons for a storehouse for New York on Blackwell's Island; 600 tons for the Gilbert & Barker Mfg. Company, Springfield, Mass., and 1000 tons for the Sprague Electric Works at Watsessing, N. J. Bids have been taken for the general contract for the Fifty-ninth Street and East River section of the New York subway system, taking 1700 tons. Recent awards of buildings embrace the following: 300 tons for a Hearn apartment, Fifty-fifth Street near Sixth Avenue, to Levering & Garrigues Company; 450 tons for buildings for the Consolidated Rendering Company, Lowell, Mass., to the New England Structural Company, and 200 tons for the Amherst College library, and 1800 tons for a power house at Dayton, Ohio, both to the American Bridge Company. The bridge lettings include 250 tons for a highway bridge at Philadelphia to the McClintic-Marshall Company and 2300 tons for the Pennsylvania to the American Bridge Company, besides the 600 tons to that company for the subway connection to the station in New York and 1200 tons awarded to the Pennsylvania Steel Company. The Erie Railroad has let the contract for the 600-ton bridge over the Erie barge canal at Rochester, N. Y. Of the Midvale Steel Company's recent lettings it appears that the Eastern Steel Company will supply 1800 tons for the blacksmith shop and crane runway at Coatesville and the Cambria Steel Company 250 tons for furnace construction, while for the ordnance shops at Nicetown, the 3000 tons will be erected by the Levering & Garrigues Company. We quote mill shipments of plain material at 2.669c. to 2.919c. New York, and out of warehouse at 3.25c. to 3.30c., New York.

Plates and Bars.—Besides universal plates being easier than sheared plates, in point of price and delivery, the narrower plates are not so strong as the wide plates. Mills in a position to roll material for ships and boilers are overwhelmed with orders and inquiries, while other plate mills have occasionally sought business. The result is that for narrower widths 2.75c. to 3c., Pittsburgh, is obtainable in 3 months delivery, while for wide plates considerable new business, particularly for the railroads, is being placed without hesitation at 4c., Pittsburgh, for no better delivery.

Export inquiry is large, even discounting the obvious duplication of offers, while boiler steel orders, especially when requiring a Lloyd specification, find few takers. One inquiry for 10,000 tons and another for 700 tons, both for Japan, are noted. In iron and steel bars few notable developments have occurred. One definite inquiry for a round tonnage of bars for Greece recognizes the American mill situation in agreeing to accept Bessemer steel. We quote mill shipments of steel plates at 2.919c. to 4.169c., New York, depending on width of plate as much as on delivery; steel bars at 2.669c. to 2.919c., the lower price for Bessemer product fairly promptly and for open-hearth steel at the convenience of the mill and little if any this year; bar iron at 2.669c., New York. Out of New York warehouse we quote iron and steel bars at 3.25c. to 3.30c. and plates at 4c. to 4.25c.

Cast-Iron Pipe.—On July 20 Atlantic City will receive bids for 1700 tons of 6, 8, 12 and 20-in. pipe, and on July 25 New York City will take bids on 120 tons of 6 and 8-in. pipe and fittings. The Standard Cast Iron Pipe Company was low on the 300 tons for Jersey City. Makers are catching up slightly on delivery dates on 4 and 6-in. pipe but competition is severe for the large sizes. Prices are unchanged and carload lots of 6-in., class B and heavier, are quoted as \$30.50 per net ton, tidewater, class A and gas pipe taking an extra of \$1 per ton.

Old Material.—The market is so dull that prices are not tested and many are largely nominal. Based mainly on offerings in the Pittsburgh district, borings and turnings have again been lowered. It is believed that scrap buying there of two weeks ago was greatly exaggerated and the contribution from local sources was hardly more than a few carloads. Brokers quote buying prices about as follows to local dealers and producers, per gross ton, New York:

Heavy melting steel scrap (eastern Pennsylvania specifications).....	\$11.75 to \$12.25
Old steel rails (short lengths) or equivalent	12.75 to 13.25
Relaying rails	28.00 to 30.00
Rolling rails	15.50 to 16.00
Iron car axles	26.00 to 27.00
Steel car axles (for domestic use)....	28.50 to 29.00
Steel car axles (for export).....	30.00 to 31.00
No. 1 railroad wrought.....	18.00 to 18.50
Wrought-iron track scrap	15.00 to 15.50
No. 1 yard wrought, long.....	14.50 to 15.00
No. 1 yard wrought, short.....	11.75 to 12.25
Light iron (nominal).....	4.00
Cast borings (clean).....	7.50
Machine shop turnings (nominal)....	4.50 to 5.00
Mixed borings and turnings.....	4.50 to 5.00
Wrought pipe	10.00 to 10.50
Old carwheels (nominal).....	15.00 to 15.50
Malleable cast (railroad).....	12.25

Foundries are not yet buying and cast scrap is at a standstill. Dealers' quotations to consumers of cast scrap are as follows, per gross ton, New York:

No. 1 cast (machinery).....	\$16.00
No. 2 cast (heavy)	15.00
Stove plate	12.00
Locomotive grate bars	12.00

British Steel Market

Rubio Ore Dearer—Maximum Prices on Steel Strictly Enforced

(By Cable.)

LONDON, ENGLAND, July 19, 1916.

Pig-iron bookings for France are freer. The tightness in hematic iron is still acute and Rubio ore is dearer, due to the Bilbao strike. Maximum prices for domestic semi-finished and finished steel are now strictly enforced. Tin plates are lifeless at 30s. to 31s. American billets are quoted at \$63 to \$61, c.i.f. Quotations, mostly nominal, are as follows:

Tin plates, coke, 14 x 20, 112 sheets, 108 lb., f.o.b. Wales, 30s. to 31s., against 29s. to 30s. a week ago.
Steel black sheets, No. 28, export, f.o.b. Liverpool, £20, compared with £20 5s. last week.
Steel ship plates, Scotch, delivered local yards, £13 17s. 6d.
Steel rails, export, f.o.b. works port, £10 17s. 6d.
Hematite pig iron, f.o.b. Tees, about 140s.

Sheet bars (Welsh) delivered at works in Swansea Valley, £10 7s. 6d., against £14 10s. a week ago.
Steel bars, export, f.o.b. Clyde, £18, as compared with £18 last week.
Ferromanganese, £35 nominal.
Ferrosilicon 50 per cent, c.i.f., £29.

The Ferromanganese Makers Well Sold Up— Maximum Prices Unchanged Yet

(By Mail)

LONDON, ENGLAND, July 4, 1916.—There is no sign of any relaxation in the stringent conditions. Contrary to expectations, no fresh official announcement has been made of any revision of maximum prices in spite of enhanced working costs, chiefly due to dearer fuel and further advances in wages. So far, attempts to impress upon the authorities the need for a general adjustment of the maxima have proved useless. The tightness will become more acute, although the authorities are undoubtedly doing the best they can to protect the progress of operations where relief is urgently needed.

The home trade price for Cleveland common foundry iron, recently raised to 87s. 6d., will probably remain in force for the last half. The demand continues brisk, but makers are not inclined to increase their bookings for delivery beyond September. Export quotations have ruled a little easier at 95s., but business is restricted by the few permits issued. Regular deliveries are being made to consumers engaged on war contracts. The number of furnaces in blast on the East Coast is 70, of which 28 are on Cleveland iron, 29 on hematite and 13 on special brands, while 5 additional furnaces should be operating by the end of July. The position of hematite is very tight, the export price remaining at about 140s. There has been a material falling off in the exports for June, due to the suspension of shipments to neutrals.

THE MANGANESE SITUATION

Owing to the ferromanganese combination being very fully sold up for all of this year, business has been quiet, although independent works have still a little to sell at prices ranging from £35 upward for loose basis, f.o.b. The tone, however, is firm, supplies of manganese ores being none too plentiful, though stocks at Bombay have been accumulating to some extent, owing to the scarcity of freight room.

Difficulty in securing semi-finished steel is as great as ever because requirements for munitions continue to swallow up most of the output. The shortage is causing considerable uneasiness among the tin-plate and black sheet mills, although the deliveries of American steel afford a little relief.

New business in finished steel has been very light with the turn of the half year, but the works are running full, chiefly on government orders. There is likely to be an extension of operations provided a better supply of raw material becomes available. A fair business has been done for some time past in shell discards at about £14 10s. for bars and angles and £15 net, f.o.b., for tees. Welsh sheet bars are still practically unobtainable, the nominal quotation being about £14 10s. delivered to local consumers.

The demand for tin plates is dull, the market being very erratic and weaker since merchants have shown some eagerness to realize profits, precipitating some competition on the part of some makers who are rather short of orders and pressing for specifications.

The Lumen Bearing Company, Buffalo, started its new electric furnace on the manufacture of Lumen metal July 14. The company has increased its pattern storage vault 50 per cent and erected a garage for its motor trucks. In September the molding capacity will be increased 50 per cent. The semi-annual sales meeting of the company was held at Buffalo July 17 and 18.

The Charleston Steel Company, Charleston, W. Va., expects to start one of its two Rennerfelt electric furnaces, which it states will have a capacity of 30 tons per day, about Sept. 15.

Iron and Industrial Stocks

Average prices for industrial stocks in the past week were somewhat lower than in the week preceding, munitions shares in particular showing weakness. There is increasing discussion in Wall Street of the extent to which the financial exhaustion of the belligerents will affect conditions in this country. The volume of transactions is little changed. The United States Steel stocks showed better resistance than some others, in view of the excellent showing expected from next week's statement. The range of prices on active iron and industrial stocks from Wednesday of last week to Monday of this week was as follows:

Allis-Chal., com. 19½-20½	Ry. Steel Spring.
Allis-Chal., pref. 70½-74	com. 40½-43½
Am. Can., com. 51½-55½	Ry. Steel Spring.
Am. Can., pref. 108½-109	pref. 97
Am. Car & Fdy., com. 52½-54½	Republic, com. 42-42½
Am. Car & Fdy., pref. 116	Republic, pref. 107½-108
Am. Loco., com. 58-63	Sloss, com. 37-45
Am. Loco., pref. 99½-100	Pipe, com. 18½-18¾
Am. Steel Fdries. 44½-46	Pipe, pref. 52-52½
Bald. Loco., com. 65½-71½	U. S. Steel, com. 83½-85
Bald. Loco., pref. 105½	U. S. Steel, pref. 117½-118
Beth. Steel, com. 419½-450	Westing. Elec. 52½-56½
Beth. Steel, pref. 127	Am. Rad., com. 397
Colorado Fuel. 41½-43½	Am. Ship, com. 40-41
Gen. Electric. 163½-165½	Am. Ship, pref. 86½-87
Gt. No. Ore Cert. 34½-35½	Chic. Pneu. Tool. 66-68
Int. Harv. of N. J., com. 113-115½	Cambria Steel. 82½
Int. Harv. Corp., pref. 106½	Lake Sup. Corp. 10½-10¾
Lackawanna Stl. 65-69½	Warwick. 9½
Nat. En. & Stm., com. 21½-23½	Cruc. Steel, com. 63½-71½
Nat. En. & Stm., pref. 95	Cruc. Steel, pref. 113-114½
N. Y. Air Brake. 118-126½	Harb.-Walk. Refrac., com. 95
Pitts. Steel, pref. 97½	Harb.-Walk. Refrac., pref. 102
Pressed Stl., com. 42½-45½	La Belle Iron, com. 51-51½
Pressed Stl., pref. 99½	Carbon Stl., com. 70-72
	Driggs-Seabury. 100-108
	Midvale Steel. 58½-62

Dividends

The J. G. Brill Company, regular quarterly 1 per cent on the preferred stock, payable Aug. 1.

The Crocker-Wheeler Company, regular quarterly 1½ per cent on the common stock, and 1¾ per cent on the preferred stock, payable July 15.

The Dominion Steel Corporation, Ltd., regular quarterly 1½ per cent on the preferred stock, payable Aug. 1.

The Taylor-Wharton Iron & Steel Company, regular quarterly 1¾ per cent on the preferred stock, payable Aug. 1.

Weight of Steel Passenger Coaches

The relative weight of steel passenger coaches of some of the leading railroads is given as follows by the *Railway Age Gazette*:

Railroad	Weight of Car, lb.	Seating Capacity	Lb. per passenger	Mounted on
Pennsylvania	120,000	88	1,364	4-wheel truck
Boston & Maine	120,000	88	1,364	4-wheel truck
New York Central	142,000	84	1,690	6-wheel truck
Central Railroad of New Jersey	115,800	78	1,480	4-wheel truck
New York, New Haven & Hartford	131,000	88	1,480	6-wheel truck

There does not seem to be any car of recent design now in service, says this journal, which improves on the figures for dead weight given above for the Pennsylvania and Boston & Maine railroads.

The total value of the abrasive materials used in the United States increased about 22 per cent in 1915, as compared with 1914. There was an increase in domestic production of natural and artificial abrasives, but a decrease in imports. The value of natural abrasives produced increased about 33 per cent, and of artificial abrasives, about 32 per cent; imports decreased about 26 per cent.

The Baldwin Locomotive Works has just purchased a tract of 71 acres of land adjoining the company's present property at Eddystone, Pa., and extending north of it and partly into Ridley Township.

The plant of the Empire Rolling Mill Company, Cleveland, Ohio, was shut down July 13 as a result of the blowing up of the flywheel and will probably have to remain idle for about thirty days.

Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, effective from April 10, 1916, per 100 lb.: New York, 16.9c.; Philadelphia, 15.9c.; Boston, 18.9c.; Buffalo, 11.6c.; Cleveland, 10.5c.; Cincinnati, 15.8c.; Indianapolis, 17.9c.; Chicago, 18.9c.; St. Louis, 23.6c.; Kansas City, 43.6c.; Omaha, 43.6c.; St. Paul, 32.9c.; Denver, 68.6c.; New Orleans, 30.7c.; Birmingham, Ala., 45c.; Pacific coast (by rail only), 65c.

Structural Material.—I-beams, 3 to 15 in.; channels, 3 to 15 in.; angles, 3 to 6 in. on one or both legs, ¼ in. thick and over, and zees 3 in. and over, 2.50c. to 2.75c. Extras on other shapes and sizes are as follows:

	Cents per lb.
I-beams over 15 in.	.10
H-beams over 18 in.	.10
Angles over 6 in. on one or both legs	.10
Angles, 3 in. on one or both legs less than ¼ in. thick, as per steel bar card, Sept. 1, 1909	.70
Tees, structural sizes (except elevator, handrail, car truck and conductor rail)	.05
Channels and tees, under 3 in. wide, as per steel bar card, Sept. 1, 1909	.20 to .80
Deck beams and bulb angles	.30
Handrail tees	.75
Cutting to lengths, under 3 ft. to 2 ft. inclusive	.25
Cutting to lengths, under 2 ft. to 1 ft. inclusive	.50
Cutting to lengths, under 1 ft.	1.55
No charge for cutting to lengths 3 ft. and over.	

Plates.—Tank plates, ¼ in. thick, 6 in. up to 100 in. wide, 2.90c. to 4c., base, net cash, 30 days, or ½ of 1 per cent discount in 10 days, carload lots. Extras are:

Quality Extras	Cents per lb.
Tank steel	Base
Pressing steel (not flange steel for boilers)	.10
Boiler and flange steel plates	.15
"A. B. M. A." and ordinary firebox steel plates	.20
Still bottom steel	.30
Locomotive firebox steel	.50
Marine steel, special extras and prices on application.	

Gage Extras	Cents per lb.
Rectangular, ¼ in. thick, over 6 in. wide to 100 in. wide. Base	
Lighter than ¼ in., to 3/16 in., up to 72 in. wide	.10
*Lighter than ¼ in., including 3/16 in., over 72 in. to 84	.20
*Lighter than ¼ in., including 3/16 in., over 84 in. to 96	.30
*Lighter than ¼ in., including 3/16 in., over 96 in. to 100	.40
*Lighter than ¼ in., including 3/16 in., over 100 in. to 102	.45
Lighter than 3/16 in., including No. 8, up to 72 in. wide	.15
*Lighter than 3/16 in., including No. 8, over 72 in. to 84	.25
*Lighter than 3/16 in., including No. 8, over 84 in. to 96	.35
Lighter than No. 8, including No. 10, up to 60 in. wide	.30
Lighter than No. 8, including No. 10, over 60 in. to 64	.35
Up to 72 in., not less than 10.2 lb. per sq. ft. will be considered ¼ in.	
Over 72 in. must be ordered ¼ in. thick on edge, or not less than 11 lb. per sq. ft. to take base price.	
Over 72 in. wide, ordered less than 11 lb. per sq. ft., down to weight of 3/16 in., take price of 3/16 in.	
Over 72 in., ordered weight 3/16 in., take No. 8 price.	
Over 72 in., ordered weight No. 8, take No. 10 price.	

Width Extras	Cents per lb.
Over 100 in. to 110 in. inclusive	.05
Over 110 in. to 115 in. inclusive	.10
Over 115 in. to 120 in. inclusive	.15
Over 120 in. to 125 in. inclusive	.25
Over 125 in. to 130 in. inclusive	.50
Over 130 in.	1.00

Length Extras	Cents per lb.
Universal plates 80 ft. long up to 90 ft. long	.05
Universal plates 90 ft. long up to 100 ft. long	.10
Universal plates 100 ft. long up to 110 ft. long	.20

Cutting Extras	Cents per lb.
No charge for rectangular plates to lengths 3 ft. and over.	
Lengths under 3 ft. to 2 ft. inclusive	.25
Lengths under 2 ft. to 1 ft. inclusive	.50
Lengths under 1 ft.	1.55
Circles 3 ft. in diameter to 100 in.	.30
Circles over 100 to 110 in. (width extra)	.35
Circles over 110 to 115 in. (width extra)	.40
Circles over 115 to 120 in. (width extra)	.45
Circles over 120 to 125 in. (width extra)	.55
Circles over 125 to 130 in. (width extra)	.80
Circles over 130 in. (width extra)	1.30
Circles under 3 ft. to 2 ft. inclusive	.55
Circles under 2 ft. to 1 ft. inclusive	.80
Circles under 1 ft.	1.85
Half circles take circle extras.	
Sketches, not over four straight cuts, inc. straight taper	.10
Sketches having more than four straight cuts	.20
Plates sheared to a radius take complete circle extras.	

*Including extra for width.

Wire Rods.—Including chain rods, \$55 to \$60.

Wire Products.—Prices to jobbers effective May 1: Fence wire, Nos. 6 to 9, per 100 lb., terms 60 days or 2 per cent discount in 10 days, carload lots, annealed, \$2.45; galvanized, \$3.15. Galvanized barb wire and staples, \$3.35; painted, \$2.65. Wire nails, \$2.50 to \$2.60. Galvanized nails, 1 in. and longer, \$2 advance over base price; shorter than 1 in., \$2.50 advance over base price. Cement-coated nails, \$2.50. Woven wire fencing, 61½ per cent off list for carloads, 60½ off for 1000-rod lots, 59½ off for less than 1000-rod lots.

The following table gives the price per 100 lb. to retail merchants on fence wire in less than carloads, with the extras added to the base price:

Nos.	6 to 9	10	11	12&13½	13	14	15	16
Annealed	\$2.50	\$2.55	\$2.60	\$2.65	\$2.75	\$2.85	\$2.95	\$3.05
Galvanized	3.20	3.25	3.30	3.35	3.45	3.55	4.00	4.10

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card in effect from April 21, 1916, all full weight pipe:

Steel		Iron	
Inches	Black Galv.	Inches	Black Galv.
1/8, 1/4 and 3/8	63	1/8 and 1/4	52
1/2	67	3/8	53
3/4 to 3	70	1/2	57
		3/4 to 1 1/2	60

Lap Weld		Reamed and Drifted	
Inches	Black Galv.	Inches	Black Galv.
2	65	1 1/4	48
2 1/2 to 6	68	1 1/2	54
7 to 12	65	2	55
13 and 14	53 1/2	2 1/2 to 4	57
15	51	4 1/2 to 6	57
		7 to 12	56

Butt Weld, extra strong, plain ends		Butt Weld, extra strong, plain ends	
Inches	Black Galv.	Inches	Black Galv.
1/8, 1/4 and 3/8	59	1/8, 1/4 and 3/8	52
1/2	64	1/2	57
3/4 to 1 1/2	68	3/4 to 1 1/2	61
2 to 3	69		

Lap Weld, extra strong, plain ends		Lap Weld, extra strong, plain ends	
Inches	Black Galv.	Inches	Black Galv.
2	63	1 1/4	50
2 1/2 to 4	66	1 1/2	55
4 1/2 to 6	65	2	57
7 to 8	61	2 1/2 to 4	59
9 to 12	56	4 1/2 to 6	58
		7 to 8	52
		9 to 12	47

Butt Weld, double extra strong, plain ends		Butt Weld, double extra strong, plain ends	
Inches	Black Galv.	Inches	Black Galv.
1/8	55	1/8	44
3/4 to 1 1/2	58	3/4 to 1 1/2	47
2 to 2 1/2	60		

Lap Weld, double extra strong, plain ends		Lap Weld, double extra strong, plain ends	
Inches	Black Galv.	Inches	Black Galv.
2	55	1 1/4	44
2 1/2 to 4	57	1 1/2	44
4 1/2 to 6	56	2	46
7 to 8	51	2 1/2 to 4	45
		4 1/2 to 6	45

To the large jobbing trade an additional 5 per cent is allowed over the above discounts.

The above discounts are subject to the usual variation in weight of 5 per cent. Prices for less than carloads are two (2) points lower basing (higher price) than the above discounts on black and three (3) points on galvanized.

Sheets.—Makers' prices for mill shipments on sheets of U. S. standard gage, in carload and larger lots, are as follows, 30 days net, or 2 per cent discount in 10 days:

Blue Annealed Sheets	Cents per lb.
Nos. 3 to 8	2.95 to 3.20
Nos. 9 to 10	3.00 to 3.25
Nos. 11 and 12	3.05 to 3.30
Nos. 13 and 14	3.10 to 3.35
Nos. 15 and 16	3.20 to 3.45

Box Annealed Sheets, Cold Rolled	Cents per lb.
Nos. 17 to 21	2.70 to 2.80
Nos. 22 and 24	2.75 to 2.85
Nos. 25 and 26	2.80 to 2.90
No. 27	2.85 to 2.95
No. 28	2.90 to 3.00
No. 29	2.95 to 3.05
No. 30	3.15 to 3.25

Galvanized Sheets of Black Sheet Gage	Cents per lb.
Nos. 10 and 11	3.25 to 3.35
No. 12	3.35 to 3.45
Nos. 13 and 14	3.35 to 3.45
Nos. 15 and 16	3.45 to 3.55
Nos. 17 to 21	3.60 to 3.70
Nos. 22 and 24	3.70 to 3.80
Nos. 25 and 26	3.85 to 3.95
No. 27	4.10 to 4.20
No. 28	4.25 to 4.35
No. 29	4.40 to 4.50

Boiler Tubes.—Discounts on less than carloads, freight to destination added, effective from April 15, 1916, are as follows:

Lap Welded Steel	Standard Charcoal Iron
1 1/2 in.	1 1/2 in.
1 3/4 in.	1 3/4 in.
2 1/4 in.	2 1/4 in.
2 1/2 and 2 3/4 in.	2 1/2 and 2 3/4 in.
3 and 3 1/4 in.	3 and 3 1/4 in.
3 1/2 to 4 1/2 in.	3 1/2 to 4 1/2 in.
5 and 6 in.	5 and 6 in.
7 to 13 in.	7 to 13 in.

Locomotive and steamship special charcoal grades bring higher prices.

1 1/4 in., over 18 ft., and not exceeding 22 ft., 10 per cent net extra.

2 in. and larger, over 22 ft., 10 per cent net extra.

Metal Markets

The Week's Prices

Cents Per Pound for Early Delivery									
Copper, New York		Tin,	Lead		Spelter				
	Lake	Electro-lytic	New York	St. Louis	New York	St. Louis	New York	St. Louis	
July									
12.....	25.75	25.50	38.62½	6.45	6.30	9.00	8.75		
13.....	25.75	25.50	38.75	6.40	6.25	9.00	8.75		
14.....	25.75	25.50	38.50	6.35	6.20	9.00	8.75		
15.....	25.50	25.25	.....	6.35	6.20	9.25	9.00		
16.....	25.25	25.00	38.00	6.35	6.20	9.12½	8.87½		
18.....	25.25	25.00	37.25	6.25	6.10	9.25	9.00		

NEW YORK, July 19, 1916.

Copper continues dull, and nominal prices are lower. Tin is over 1c. lower, and consumers are beginning to show interest. Lead is quiet, and a further reduction by the leading interest is looked for. Spelter is a little firmer following buying by galvanizers. Antimony shows no life, and is lower.

New York

Copper.—Practically the only business in copper is in resale lots, which are offered at substantial concessions, but there is not much trading of this character. As a rule, consumers are indifferent to the market. Opinions differ as to how much prompt metal would be available should demand arise. On some sides it is said that there would be no difficulty in securing round lots at the bottom of the market, while others say comparatively little could be had. It is asserted that the producers are sold up to September, while it also is said that they have prompt metal to offer, and that, as a matter of fact, they are beginning to solicit orders. Electrolytic for July delivery can be had easily for 25c., cash, New York, and it is probable that this price can be shaded. For future delivery, second-hands are asking 23c. to 24c. The producers are asking around 26c. for July and August. Lake is quotable around 25.25c., cash, New York. Electrolytic at London is weak at £122, having declined £6 in a week. The exports this month, including yesterday, total 15,235 lb.

Tin.—In the past week there has been almost nothing doing, but the steady decline in price has aroused the interest of consumers and the trade would not be surprised if a moderate amount of activity ensued. Some quiet buying of small lots is reported. Yesterday there were a few sales for future delivery. The supply of Banca tin, which sells at less than Straits, is larger than usual, and more is on the way. The quotation for spot Straits yesterday was 37.25c. The arrivals this month total 1580 tons, and there is afloat 2109 tons. The London market is weak, with spot Straits standing yesterday at £164 10s.

Lead.—A few export sales comprise the activity in this metal. The domestic demand is light, and it is expected daily that the leading interest will lower its quotation of 6.50c., New York, and 6.42½c., St. Louis. Independent producers are asking 6.25c., New York, and 6.10c., St. Louis, but it is safe to assert that they are not getting many orders, even at these prices. Consumers are maintaining a waiting attitude. Influences tending to support the market are very few. One is a railroad strike in Spain, which may make it a little difficult for the warring powers to buy Spanish lead, in which event they may turn to this market. The exports this month, including yesterday, total 2046 tons.

Spelter.—With prompt spelter at 9c., New York; September around 8c., and October at 7.75c., prices which prevailed late last week, the galvanizing interests became active and a good tonnage for all positions was taken. The buying caused quotations to go up a few points, but they since have dropped to 9.25c., New York, and 9c., St. Louis. The London quotation for spot is stronger at £48. The deliveries this month, including yesterday, total 4407 tons.

Aluminum.—The market is unchanged at 58c. to 60c. for No. 1 virgin aluminum, 98 to 99 per cent pure.

Antimony.—Although one sale of a round lot to a munitions maker is reported, the market in general has continued sluggish and the spot quotation is lower at

14c., duty paid. Antimony in bond is quoted at from 11 to 11.50c.

Old Metals.—The market is still somewhat unsettled, with copper weak but zinc showing signs of strength. Dealers' selling prices are as follows:

	Cents per lb.
Copper, heavy and crucible.....	22.00 to 23.00
Copper, heavy and wire.....	21.00 to 22.00
Copper, light and bottoms.....	17.00 to 18.00
Brass, heavy.....	13.00 to 14.00
Brass, light.....	10.00 to 10.50
Heavy machine compositions.....	17.00 to 18.00
No. 1 yellow rod brass turnings.....	13.50 to 14.50
No. 1 red brass or composition turnings.....	14.50 to 15.50
Lead, heavy.....	6.00
Lead, tea.....	5.50
Zinc.....	7.00 to 8.00

Chicago

JULY 17.—With the market generally sluggish, prices have been subject to concessions. Copper in this market has held better than elsewhere and sales have brought relatively higher prices. Lead has been sold by independent interests at substantial reductions. The spelter quotation is now a little above the low point. We quote: Casting copper, 24c. to 24.25c.; Lake copper, 26.50c.; tin, carloads, 38.50c., and small lots, 40.50c.; lead, 6.25c. to 6.45c.; spelter, 9c.; sheet zinc, 15c.; Cookson's antimony, 50c.; other grades, 16c. On old metals we quote buying prices for less than carload lots as follows: Copper wire, crucible shapes, 17.75c.; copper bottoms, 15.75c.; copper clips, 16.75c.; red brass, 15.50c.; yellow brass, 11.50c.; lead pipe, 4.50c.; zinc, 5c.; pewter, No. 1, 27c.; tinfoil, 27c.; block tin pipe, 32c.

St. Louis

JULY 17.—Non-ferrous metals continue to ease off, particularly the Missouri products, lead and spelter. Quotations at the close to-day were as follows: Lead, 6.20c. to 6.30c.; spelter, 8.25c. to 8.75c.; tin, 41c.; Lake copper, 26c.; electrolytic copper, 25.75c.; Asiatic antimony, 16c. In the Joplin ore district prices declined still further, as a result of the slump in spelter, so that the basis price for 60 per cent zinc was from \$50 to \$70 per ton for zinc blende, with the average for the week \$65. A number of mines shut down as a result of the lower prices, while an accident to one of the central electric power plants still further contracted production, so that the output was curtailed at least 1000 tons for the week. Calamine sold at \$40 to \$50, with the week's average \$45. Lead ore brought \$72.50, basis of 80 per cent metal, with the district average at \$75, as a result of high assays developing premiums and also of higher prices early in the week. On miscellaneous scrap metals we quote dealers' buying prices as follows: Light brass, 7.50c.; heavy yellow brass, 10.50c.; heavy red brass and light copper, 14.50c.; heavy copper and copper wire, 17c.; pewter, 25c.; tinfoil, 30c.; lead, 5c.; zinc, 4.50c.; tea lead, 3.50c.

The importance of developing a skeleton plan of an industrial establishment so that the proper arrangement of the various units can be worked out before the buildings themselves are designed is brought out in an article on "Skeletonizing an Industry" which appears in the initial number of *Development*, published by Day & Zimmermann, consulting and operating engineers and architects, 611 Chestnut Street, Philadelphia.

The Urschel Drop Forge Company, Bowling Green, Ohio, recently incorporated with a capital stock of \$100,000, has elected P. H. Urschel, president and general manager; W. D. Rockwell, first vice-president; Alfred W. Place, second vice-president; B. C. Harding, treasurer, and Clyde V. Urschel, secretary.

The copper, brass, iron tank and machinery business of George F. Ott has been incorporated as the George F. Ott Company, 213 Buttonwood Street, Philadelphia. Mr. Ott is president and treasurer; John Limprun, vice-president and manager, and Otto Guessefeldt, secretary and superintendent.

The Newman-Andrew Company, American agent for the Toledo Steel Works, Sheffield, England, has removed from 107 West Street, New York, to new and larger offices at 26 Cortlandt Street.

OBITUARY

JAMES HOBART MOORE of Santa Barbara, Cal., brother of Judge W. H. Moore of New York, with whom he formed four great corporations in the steel trade, known as the Moore group, died at Lake Geneva, Wis., July 18. The Moore brothers were Chicago attorneys and their first exploit in corporation ownership was the control of the Diamond Match Company. An attempt to corner this company's stock led to a panic on the Chicago Stock Exchange. Later the Moore brothers made a fortune in the National Biscuit Company and with others obtained control of the Rock Island Railroad. In 1899 and 1900 they organized the American Tin Plate Company, the American Sheet Steel Company, the National Steel Company and the American Steel Hoop Company. All of these corporations afterward entered into the United States Steel Corporation.

FRANZ HANIEL died at Düsseldorf, Germany, in the last week of June, aged 74 years. He was one of the leading figures in the West German coal and iron industries, having been a director of the Gutehoffnungshütte, a partner in the engineering works of Haniel & Lueg of Düsseldorf, and the ship-owning firm, Franz Haniel & Co., of Ruhrort. He was also a member of the council of the Rhenish-Westphalian Coal Syndicate.

PERSONAL

Col. William C. Skinner, vice-president and chairman of the board of directors, was elected president of the Colt's Patent Fire Arms Mfg. Company, Hartford, Conn., at a meeting of the directors held July 13, succeeding Charles L. F. Robinson, who died suddenly two weeks ago. Lewis Sperry was elected a director to fill the place of Mr. Robinson.

Z. G. Simmons, president of the Simmons Company, Kenosha, Wis., producer of steel beds and springs, has been elected president of the recently organized Chamber of Commerce of Kenosha.

George Rhines, formerly general superintendent of Stanley G. Flagg & Co., at Stowe, Pa., and thereafter connected with the Allith-Prouty Company in Danville, Ill., was appointed secretary of that company on July 1.

Emile J. Bayle has resigned as production manager of the Aluminum Castings Company, Detroit, Mich.

J. H. Regan, assistant secretary and treasurer of the Pressed Steel Car Company, New York, who left this country for Petrograd early in June, 1915, and spent part of the time at Vladivostok, supervising the erection of the car assembling plant at that point, is expected back in the United States by July 28.

Henry M. Sonnenthal, and Frederick M. Sonnenthal, two of the directors of the Selson Engineering Company, Ltd., 78 Broad Street, New York, have changed their surname and will in the future be known as Henry M. Selson and Frederick M. Selson.

Earl McIntire, for several years civil engineer at the mills of the Republic Iron & Steel Company, Youngstown, Ohio, has resigned to take a similar position at Ojibway, Ontario, at the Steel Corporation's new operation.

A. F. S. Blackwood, lately vice-president of the Michigan Steel Castings Company and vice-president and general manager of the Monarch Steel Castings Company, has resigned from the latter to become president and general manager of the Blackwood Steel Foundry Company at Springfield, Ohio. The Blackwood company expects to be in full operation by the middle of August as the largest producer of small steel castings in the West.

Herman Nieter, formerly manager of the New York office of the Blaw Steel Construction Company, Pitts-

burgh, is now sales engineer of the American Spray Company, New York City.

William J. Sullivan, secretary to President Farrell of the United States Steel Corporation, has gone on an extended trip to Alaska.

Frederic Allart, of the New York sales office of Lukens Iron & Steel Company, is spending the month of July in England.

American Industrial Commission to France

An American Industrial Commission, composed of a dozen to twenty men of national reputation, is to go to France in August. Its object is, primarily, to make a technical investigation of present conditions in France looking to the reconstruction and reorganization of her communities and industries, which will take place now and after the war, and to determine the manner in which the United States may contribute, and to arrange for largely increased purchases of French products. The undertaking is based upon cordial proposals which came unsolicited to the American Manufacturers Export Association. Extraordinary facilities have been granted by the French government to aid the commission, and an account of the commission's visit will be published for general distribution under the authority of the association.

It is intended to include in the representation all the industries of the United States concerned in French trade under the following classifications:

I. Prime movers: (Steam, gas and oil engines; pumping engines, steam and hydraulic turbines, condensers, Generators and all other adjuncts.) Heavy machinery: (Rolling mills, iron and steel products, etc.)

II. Machine-tools, wire, transmission and textile machinery.

III. Milling machinery: (Flour and saw mills; cement, mining, smelting, agricultural and road machinery.)

IV. Electrical apparatus.

V. Transportation: (Locomotives, cars, naval vessels, etc.)

VI. Importers: (Textiles, including laces; dry-goods of all kinds; porcelains, groceries and wines; toys.)

VII. Synthetic products based on chemical processes; chemicals, explosives, etc.

VIII. Bankers.

IX. Factory architects, engineers and contractors.

W. W. Nichols, Allis Chalmers Mfg. Company, is chairman of the commission, but its entire makeup is not yet settled, as difficulty is experienced in getting men of broad experience in their respective lines who find themselves free to go and who will lend dignity and standing to the enterprise and guarantee a result both conclusive and effective.

The itinerary, with transportation throughout France provided by the government, includes visits to the following cities: Bordeaux, Limoges, Aubusson, Le Mont-Dore, Clermont-Ferrand, Vichy, St. Etienne, St. Chamond, Lyon, Arles, Marseilles, Grenoble, Chambéry, Aix-Les-Bains, Annecy, Chamonix, Evian, Nantua, Oyonnax, St. Claude, Morez, Malbuisson, Besançon, Montbeliard, and Belfort.

The Penn Seaboard Steel Corporation

The Penn Seaboard Steel Corporation is the name of a company, recently formed, resulting from the consolidation of the Seaboard Steel Casting Company of Chester, Pa., with the Penn Marine & Ordnance Castings Company, the latter being a consolidation of the Penn Steel Castings & Machine Company of Chester and the Baldt Steel Company of Newcastle, Del. The new corporation therefore has three large acid, open-hearth steel casting plants making all grades of steel castings. The main offices of the company are at 132 South Fifteenth Street, Philadelphia, and the officers of the corporation are Rodney Thayer, president; Walter S. Bickley, vice-president; C. F. Jemison, secretary, and Ivers S. Adams, treasurer. These, with the following persons, constitute the board of directors: H. D. Gibson, H. J. Fuller, J. E. Richards, E. Du Pont, F. W. Pritchett, L. L. Durham, A. L. Corey, H. F. Hansell, Jr., Charles Day, W. C. Sproul and E. E. Bennett.

Pittsburgh and Nearby Districts

The output of sheets in the sheet mills in the Youngstown, Ohio, district since July 1 has been reduced to some extent by the excessively hot weather, and also because of inventories under way at a number of the plants. Owing to the lower prices on galvanized sheets, due to the heavy decline in spelter, sheet manufacturers in the Youngstown district report a heavier demand for galvanized sheets, orders from the roofing trade being better than for some time.

Homer D. Williams, president of the Carnegie Steel Company, and Charles E. Dinkey, general superintendent of the Edgar Thomson steel works of the company, have taken an active interest in the advancement of the community welfare movement at Braddock and other mill towns in western Pennsylvania, and a series of educational motion pictures is being given this summer in Braddock and North Braddock, Pa.

The Youngstown Sheet & Tube Company, Youngstown, Ohio, will pay its puddlers for July and August \$8.40 per ton, against \$7.42 per ton, which was the rate in May and June. This company does not sign the Amalgamated scale, but pays the Amalgamated rate for puddling, or more.

At the bi-monthly examination of sales of sheets in May and June, held in Youngstown, Ohio, last week, it was found the average price of shipments of Nos. 26, 27 and 28 gage black sheets was 2.60c. The base of the wage scale is 2.15c. and the advance of 45c. over the base price entitles sheet mill hands working in mills that sign the Amalgamated scale to an advance of 13½ per cent in wages for July and August over May and June. In the tin-plate scale it was found that the average base price on shipments of tin plate in May and June was \$3.90 per base box. The minimum of the scale is \$3.50 per base box, and for each 5c. advance in the selling price per base box, there is an advance of 1 per cent in wages of tin-plate workers. The wage rate, therefore, for tin-plate workers in July and August will show an advance of 8 per cent over the rates paid for May and June. The mills directly affected by the bi-monthly examinations of sheet and tin-mill prices are as follows: Brier Hill Steel Company, Youngstown; Youngstown Iron & Steel Company, Youngstown; Trumbull Steel Company, Warren; Western Reserve Steel Company, Warren; De Forest Sheet & Tinplate Company, Niles, Ohio; Newport Rolling Mill Company, Newport, Ky.; National Enameling & Stamping Company, Granite City, Ill.; Follansbee Brothers Company, Follansbee, W. Va.; American Rolling Mill Company, Middletown, Ohio; Canton Sheet Steel Company, Canton, Ohio, and the Massillon Rolling Mill Company, Massillon, Ohio.

The blast furnace of the Struthers Furnace Company at Struthers, Ohio, will blow in this week on Bessemer iron. A new skip hoist has been added and other improvements made, and the furnace is expected to make from 400 to 450 tons of iron per day. It is said a contract for 10,000 tons of Bessemer iron for foreign shipment will be filled by the Struthers furnace.

At a meeting of stockholders of the Petroleum Iron Works Company, held at Sharon, Pa., on Friday, July 14, it was decided to increase the capital stock from \$1,000,000 to \$3,000,000. The additional capital of \$2,000,000 will be used by the company in making extensions and adding new equipment. Definite plans have not yet been fully made. On Saturday, July 15, a meeting of stockholders of the Pennsylvania Tank Car Company, an identified interest of the Petroleum Iron Works Company, was also held; it was decided to increase the capital stock of this concern from \$500,000 to \$1,000,000 for additions to its plant.

It is stated that the 300,000 boxes of tin and terne plate, which have been advertised for sale extensively in the past two weeks by a machinery interest at Pittsburgh, is the proposed output of the Pittsburgh Sheet & Tin Plate Company, which, it is understood, has secured control of the plant of the Union Sheet & Tin Plate Company at Marietta, Ohio, and which was de-

clared bankrupt in 1910. The plant was acquired by the Commonwealth Title Insurance & Trust Company, Philadelphia, as trustee for the bondholders, and was later sold to the Pittsburgh Sheet & Tin Plate Company. It is said the plant, which has long been inactive, may be started before long if the sale of the 300,000 boxes of tin and terne plate is consummated and satisfactory arrangements made for securing a supply of sheet bars.

The Milwaukee Gas Coal Company, Milwaukee, has recently purchased in Fayette County, W. Va., about 1000 acres of coal lands. The coal will be mined by a company known as the St. Clair Coal Mining Company. The property purchased was that of the St. Clair Collieries Company, and acquired by lease of the Mecca Collieries Company, the M. B. Coal & Coke Company and the Gordon Coal & Coke Company.

Persistent reports in Pittsburgh are that the United States Steel Corporation, through its subsidiary interest, the H. C. Frick Coke Company, will secure control before long of the Pittsburgh Coal Company.

The H. C. Frick Coke Company of Pittsburgh, Pa., has blown out about 250 coke ovens for operating reasons only.

Last week the United States Government sent inquiries to Pittsburgh for nearly 950,000 projectiles. The proposals for these will be received at the Bureau of Ordnance, Navy Department, Washington, D. C., J. Strauss, chief, until noon, Aug. 23, for supplying projectiles as follows: 9000 14-in. armor-piercing; 2800 14-in. Class B; 31,500 6-in. common; 185,600 5-in. common; 139,529 4-in. common; 300,000 3-in. common; 87,500 1-lb. anti-aircraft and 187,500 1-lb. common projectiles, a total of 943,429 projectiles.

The American Tar Products Company will make extensions to its plant on Crab Creek, Youngstown, Ohio, to consist of a 10,000-gal. tar still, condensers and coolers, as well as a small naphthalene plant. The company will also erect a new laboratory and wash room and lockers for employees. Proposed extensions will give a 40 per cent increase to the still capacity of the plant.

The Westinghouse Electric & Mfg. Company, East Pittsburgh, has started the sixth annual summer course in electrical engineering, which is open to college and high school instructors desirous of engaging in practical electrical work.

James H. Beans, Martins Ferry, W. Va., has taken bids for the construction of a foundry addition, 50 x 100 ft., to be erected to the north of its present plant and contain two lean-to wings, 30 x 100 ft. each. It will increase its melt from 15 to 35 tons. The improvements are estimated to cost \$25,000.

The C. E. Carter Company, manufacturer of mechanical toys, Erie, Pa., has purchased a site and is erecting a two-story factory. It has orders for delivery into 1918.

The Wheeling Can Company is remodeling the factory in South Warwood, near Wheeling, W. Va., formerly occupied by the Packard Motor Truck Company, and is installing new machinery to make tin cans.

The Baltimore & Ohio has appropriated \$500,000 for improvements and additions to its docks at Lorain, Ohio. A coal loading machine will be installed.

The Brier Hill Steel Company, Youngstown, Ohio, as a part of its welfare work, will erect a restaurant for the benefit of its employees. The new structure will be 30 x 75 ft. and will be erected as near as possible to the center of operations at its steel plant for the convenience of the men. Hot and cold drinks, according to the season, will be served at nominal cost.

National Tube Company's Gary Plant

Sites for the various buildings of the \$25,000,000 plant of the National Tube Company, at Gary, Ind., are being laid out, and announcement of construction is expected to be made at an early date. It is understood that the company will build between 800 and 1000 houses to take care of its additional employees.

Seizure and Operation of Industrial Plants

The Provision Stricken from the Naval Bill—War Department Censor on the Mobilization of Europe's Industries for the War

WASHINGTON, D. C., July 18.—A sharp controversy has arisen in Congress over the proposition incorporated in the so-called National Defense Act of June 3, 1916, which empowers the President in time of war or when war is imminent to compel manufacturers to furnish war material at prices satisfactory to the Government and to give preference to such orders, and further authorizes the taking over by the Government of any plant the owners of which shall refuse to furnish material ordered by the Ordnance Bureau of the War Department. This extraordinary provision was adopted in spite of the opposition of a considerable number of the members of both Houses. It was not practicable to cause it to be stricken out on a point of order as new legislation, for the reason that the National Defense bill was not a budget measure, but in all its most important provisions was itself new legislation.

Notice has now been given by certain senators that the objectionable provision shall not be expanded through its incorporation in the pending naval and military appropriation bills and the presiding officer of the Senate has already sustained a point of order raised by Senator Borah of Idaho eliminating from the Naval bill a section which followed verbatim the so-called "seizure and operation" provision of the National Defense Act. As a result, the anomalous condition has developed that the President has the right to enforce by the most drastic means orders that may be placed by the War Department while he has no authority whatever as to similar orders given to manufacturers by the Navy Department. The Army appropriation bill has not yet been acted upon by the Senate, but if, as the result of the activity of Senator Borah and certain of his colleagues, it is provided therein, either directly or inferentially, that the appropriations carried by the measure shall not be available for the purchase of goods ordered in accordance with the provisions of the National Defense Act an exceedingly nice and highly important question of law will be raised with a strong probability that the courts will hold this feature of the Defense Act to have been repealed.

NAVAL SECRETARY'S "JUDICIAL" MIND

In moving to strike from the Naval bill the "seizure and operation" provision, Senator Borah said in part:

"I have no objection at all to the Government going into the manufacture of munitions of war, but to give the head of a department the right to go in at his own discretion and upon his own view as to what constitutes a right price and so forth, take possession and make people who disagree with him as to the value or price punishable by fine and the penitentiary is something that is so obnoxious to me that I would not consent to its going in, and I would not vote for the bill if it was in. I think there is a way to democratize preparedness just the same as there is to democratize government, and I do not think we should ape absolute or monarchical governments in the way of preparing ourselves. There is no necessity for those things. Does anybody suppose that if war actually existed in this country or was imminent the manufacturing establishments of the country would not give their plants over to the Government if they were unable themselves to operate them effectively, or that they would not put their plants at the service of the Government to the fullest capacity? If, on the other hand, war did exist and they should fail to aid the Government, we could pass a resolution or a bill here in an hour for the purpose of taking possession of them."

Senator Weeks of Massachusetts called the Senate's attention to the fact that the Secretary of the Navy is on record in the hearings before the House Committee

on Naval Affairs as saying that he would not buy armor of the existing armor plate plants if they would furnish it for nothing and inquired whether the Senate would favor leaving to a secretary who made such a broad statement the important question as to what constitutes a "reasonable price." Senator Weeks also pointed out that if the secretary should determine that the present price was unreasonable he would be able to bring about the prosecution and fining of the armor manufacturers simply because they did not happen to agree with his views as to values.

Senator Borah's point of order was thereupon renewed by Senator Oliver of Pennsylvania and was sustained by the chairman, who stated that he was "clearly of the opinion that the amendment is not connected in any way with the rest of the bill."

HOW EUROPE MOBILIZED INDUSTRY

Notwithstanding the interesting and important questions raised by the action of the Senate, the War Department, through the newly created office of censor, has just promulgated an official statement for the information of manufacturers in which are incorporated the "seizure and operation" provisions of the National Defense Act, the text of which appeared in THE IRON AGE of May 25. With a view to emphasizing the necessity for the enactment and enforcement of these provisions, the censor gives the following summary of the industrial mobilization work of the European countries now at war:

The mobilization of industries has been undertaken in all the countries that are at present at war. Reports from abroad are incomplete on this subject, but all indicate that a more or less perfected scheme has been adopted in all countries. An enabling act is the first requisite, and the details of its exercise vary in each of the countries.

In Russia a committee was appointed to supervise the manufacture and supply of war munitions, making use of all civilian plants. The president of the duma, an ex-minister of commerce, and two prominent army officials were also made members of this committee for purposes of consultation in regard to technical matters.

In England the government control of all engineering industries was taken over under an act called the "mobilization of industry act." This was passed with ease and rapidity by the House of Commons. The original act provided for the taking over and control of any works where war munitions were being made. Later, the act was amended to include all industries that could be utilized if modified. Power to cancel existing contracts with private parties was also made a part of the law.

In France an act called the "Dalbiez act" was passed under which all commercial manufacturing plants used in whole or in part for making supplies for the army were taken over by the government. Originally all skilled workmen, heads of departments and superintendents were excused from military service. It was found that this exemption was abused, and a large number of men suitable for military services, but not absolutely necessary in the manufacturing plants, avoided military service.

The civilian superintendents of the works taken over report that they have no trouble with strikes or labor disorders while under military control, for as soon as a workman by his act shows he is not necessary in the plant itself he is available to go to military service in the field, which acts as a deterrent against strikes.

In Italy all the larger automobile factories or garages have been taken over for the manufacture of war munitions.

Similar provisions have been made in Austria and Germany. In most of these countries this mobilization of industries is carried down to the smaller industries in minute detail. For example, in both Austria and France all the horses and wagons suitable for military service are listed, and the record is kept by area officers, so that the government at any time can ascertain how many horses and wagons are available, and their condition, in any stated district. There

is a price fixed by law at which owners shall be reimbursed for their teams and wagons used for military purposes.

In view of the action of the Senate on the Naval bill it is possible that the Senate Committee on Military Affairs will omit from the Army appropriation bill all references to the seizure and operation of plants, relying upon what has already been incorporated in the National Defense Act. If this course is followed much ingenuity will be required to be shown by the opponents of this drastic legislation to secure the insertion in the Army bill of a provision of some kind designed to repeal or modify the objectionable feature of the National Defense Act.

W. L. C.

Equipment for Thirty-three Motor Truck Companies

The War Department at Washington has ordered 231 trucks from the Kelly-Springfield Motor Truck Company, Springfield, Ohio. Of these, 165 will be $3\frac{1}{2}$ -ton and 66 will be $1\frac{1}{2}$ -ton chassis. The order is for seven motor truck companies, all fully equipped, and each comprising 33 trucks. The Kelly-Springfield Company is not only furnishing the trucks complete, bodies and chassis, but agrees to recruit and train the members of the companies and turn fully prepared and organized motor truck units, or companies, of 33 trucks each, over to the Government. Each company consists of a truck master and three assistants, a chief mechanic and two assistants, forty-four drivers and two cooks.

The Packard Motor Car Company has received an order from the United States War Department for 198 additional Packard motor trucks, which order brings the total of this make of truck purchased by the Government since March 20 to 716 vehicles, representing an investment of more than \$2,000,000. The War Department has invoked the aid of the new army bill, which became a law on June 3, 1916, and which provides that in an emergency such as the present one manufacturers must give precedence over all their other work to army orders. Shipments of truck trains, consisting of 33 vehicles each, are going forward as rapidly as possible. Outside cities are beginning to produce volunteers for the companies of drivers and mechanics to operate and care for the trucks in the army service.

New England Founders Meet at Athol

Members of the New England Foundrymen's Association to the number of 124 assembled in Athol, Mass., for their July meeting as the guests of the Athol Machine Company and the L. S. Starrett Company. Stephen E. French, president of the association, showed the visitors through the plant of the Athol Machine Company and served a bountiful lunch following the inspection of the foundry and machine shop. The members were then conveyed in automobiles to the plant of the L. S. Starrett Company, where an inspection was made of the processes and machines used in the production of mechanics' fine tools. The party was then carried to the summer camp of Mr. French at "The Pines," where swimming, sports and a shore dinner kept everyone busy. The August meeting will be held in Providence, R. I.

Concessions for 24 years have been granted for the extraction of iron ore in the basin of the Yellow River in the Bent Horn (Krivoi Rog) District, Russia, near Zelonaya on the Kharkof-Nikolaief railroad. The land comprises 16,000 acres and the holders must guarantee to mine enough ore to make the annual rent amount to \$3,000, on a royalty of \$0.17 per net ton mined. Assays have shown very good deposits.

The 1-in. screw machine of the Pierce Machine Tool Company, 617 West Jackson Boulevard, Chicago, Ill., which was illustrated in THE IRON AGE of June 22, has an internal thread in the spindle, this arrangement, it is explained, tending to give the machine additional rigidity.

MORE MESABA MINES WORKING

Deeper Water Makes Shipment of 60,000,000 Tons of Ore Probable

DULUTH, MINN., July 19—(By Telegraph).—Several more underground mines were opened on the Mesaba range this week and the working forces are being increased daily. The union seems to be in a bad way right now, as there are few leaders to keep the men in line and there are many desertions. Eight leaders are still in the Duluth jail, but it is reported that another set will soon be on the range to take their places. If this is true there will probably be further trouble. There was little excitement this week, with the exception of strikers being arrested for picketing and the placing of dynamite in a switch on one of the ore roads. This was discovered before any damage was done. Twenty men were arrested in one lot in Nashauk for picketing and a small number were picked up at other places in the district.

It is estimated that the strike has cost over \$2,000,000 to date, when the loss in wages to the men and the loss of the operators are figured, together with the cost to the county. There are now about 2000 men doing police duty in the strike zone, including the force employed by the mining companies and the cities, in addition to the Sheriff's force.

Ore is still going forward at a steady rate. Government officials announced this week that boats with a draft of 20 ft. 10 in. can now get down the lakes. This gives an increase of 11 in. and will mean that the average size freighter can carry about 800 tons more of iron ore per trip. This will increase the lake shipments for this month and as long as the water is high. It is now believed that over 60,000,000 tons can be handled during the season.

A few agitators have been at work on the Gogebic range and some of the other Michigan ranges, but they are unable to make any progress. Most of the miners throughout the Lake Superior district realize that they cannot hope to benefit themselves by affiliating with the I. W. W.

Taylor-Wharton Iron & Steel Company

In connection with an offer of \$800,000 in five-year 5 per cent convertible gold bonds, President Knox Taylor of the Taylor-Wharton Iron & Steel Company, recently outlined the earnings record of the company. For the three years ended Dec. 31, 1915, the annual net earnings, after deducting expenses, including more than \$750,000 charged for maintenance and depreciation, averaged over \$250,000, and interest charges and sinking fund requirements have averaged less than \$115,000. The earnings for the current fiscal year to June 1, 1916, charging regular depreciation and with increased allowance for maintenance, warrant, he says, an estimate of net earnings for the present year of over \$400,000, and interest and sinking fund charges on all bonds, including the issue of convertible bonds, amount to less than \$215,000.

The bond issue mentioned is to retire the temporary financing occasioned largely by the building of the new plant at Easton, Pa., and to provide additional working capital and funds for improvements to be made to the Philadelphia property of the company, which includes the Philadelphia Roll & Machine Company and the Tioga Steel & Iron Company. The new Easton plant has not yet contributed to earnings, as it is now only being equipped. Its cost is upward of \$1,600,000 and when completed will represent an investment of approximately \$2,000,000.

The L. C. Blancke Company, 10 Thomas Street, New York, recently incorporated with a capital stock of \$100,000, has taken over the small-tool business formerly conducted by Boker & Co., Inc. It deals in high-speed and carbon tool steel, chisel and die steel, drills, etc. L. C. Blancke is president; A. J. Talley, secretary, and C. Ter Meer, treasurer.

STRIKES AND SETTLEMENTS

Machinists' Strike On at Milwaukee

MILWAUKEE, WIS., July 18—(By Telegraph).—The long expected strike of organized machinists in the Milwaukee district began at 10 o'clock this morning, when 1000 to 1250 men walked out at the main works of the Allis-Chalmers Mfg. Company in West Allis, 190 at the Reliance works in Milwaukee and 287 at the Pawling & Harnischfeger crane works. There was no disorder. Wednesday morning men in at least two more big shops will be called out. The strike was originally scheduled for Monday morning, but owing to the intervention of Gov. E. L. Phillips, who used every effort to bring about arbitration, the initial walkout was delayed one day. The Metal Trades and Founders' Association has maintained a firm attitude, insisting that the July 1 reduction of the weekly work schedule was a reasonable concession and that it had nothing further to arbitrate. The machinists demanded an eight-hour day without reduction of the present nine-hour pay, but appear eager to arbitrate. The following statement was issued to-day from the Allis-Chalmers works: "The Allis-Chalmers Mfg. Company employs a total of 7000 men in Milwaukee County. Of these about 2400 are classed as machinists. Of these machinists approximately 1000 went out on strike Tuesday morning."

Sheet and Tin Plate Wage Advance

The American Sheet & Tin Plate Company, Pittsburgh, has granted an advance of about 13½ per cent in wages to employees of its sheet mills and about 8 per cent to employees of its tin plate mills, effective from July 1. These are the same wage advances granted recently in sheet and tin plate mills that signed the Amalgamated scale.

No Sympathetic Foundry Strike in Youngstown

Officials of the International Molders' Union in Youngstown, Ohio, deny the report that this organization will order its molders to go out on a sympathy strike with the machinists who have been on strike since May 1. They say that this organization has a contract with the foundry operators in the Youngstown district that continues until July 1, 1917, and that they intend to keep the contract.

The Mahoning Valley Employers' Association, Youngstown, Ohio, states that good progress is being made in securing machinists to work in the shops of the various concerns in the Youngstown district.

The machine shop of the Lloyd-Booth department of the United Engineering & Foundry Company at Youngstown, Ohio, is now operating at more than 50 per cent of capacity, the company having recently secured machinists from other cities and taking them to Youngstown to work in its shops. The William Tod Company, whose machinists have also been out on strike since May 1 for an 8-hr. day, is steadily increasing the number of machinists at work, and it is believed that in a short time the shops of both these concerns will be in full operation. Already a number of the old employees have returned to work, and others are expected.

Molders on Strike in Bridgeport

Trouble has broken out among the molders in Bridgeport, Conn., and more than 200 men are on strike at the foundries of the Coulter & McKenzie Company, the Joseph A. Taylor Company and the Automatic Machine Company. The demand is for a minimum wage of \$3.75 per day. Present wages run from \$3 to \$5 a day and the shops are not unionized.

The night shift of laborers at the North Side plant of the H. B. Smith Company, Westfield, Mass., has struck for a wage of \$2.50 in place of the present \$2.25.

About forty employees of the Cowan Truck Company, Holyoke, Mass., have walked out after their demand for a 48-hr. week and 10 per cent increase in wages has been refused. Officials state that the pay of the machinists had been increased 16 per cent and the working schedule reduced 3 per cent within the past

year and that conditions do not warrant further concessions at this time.

Meeting an Emergency at Steelton

A transportation feat of some magnitude was accomplished by officials of the Steelton plant of the Bethlehem Steel Company, July 17, when employees of the Harrisburg Railways Company suddenly went on a strike, badly crippling transportation facilities. With only a few hours' notice officials arranged with the Philadelphia & Reading Railroad to operate several special trains between Harrisburg and Steelton and a number of motor trucks were pressed into service to towns within a radius of eight miles. The haul between Harrisburg and the Steelton plant is about four miles and more than 6000 employees were brought to their places almost without exception on their regular time. Later an adequate schedule of trains was arranged to operate between the various towns until the strike ends.

Conditions in Toronto Munitions Plants

A detailed report of labor conditions in Toronto munitions plants has been submitted at a meeting of the Resources Committee held at the Parliament Buildings. The investigation confirms the opinion that there is a considerable shortage of labor, particularly tool makers and skilled mechanics, but an almost equal need is felt for general laborers. The shortage has given rise to many minor labor troubles and a constant shifting of men from one establishment to another, which lessens the production. The labor stringency is being met by training men and women and by definite attempts to secure labor from outside points. Every man who offers himself and is competent to work in these plants is being taken on. It was found that in plants visited approximately 200 women are at present employed and that this number will be more than doubled in the near future. Manufacturers state their willingness to pay women as much as men if they measure up in efficiency and general satisfaction.

Other Localities

Employees of the Eastern Steel Company, Pottsville, Pa., have demanded an increase in wages.

Employees of the McClintic-Marshall Company, Pottstown, Pa., after being out for nearly two months, have returned to work.

Having completed its orders for shrapnel shells, the J. L. Mott Company, Trenton, N. J., has closed down its munition plant and laid off a large number of men.

The structural steel employers of San Francisco and the Bay cities issued a statement July 10 covering the labor and industrial situation which has led them to refuse an 8-hr. day for the employees. They declare that they are now paying 35 per cent higher wages than Eastern competitors and that any further increase in operating expense will end in shutting down the plants here.

Sale of the Florence Iron Works

The Florence Iron Works, Florence, N. J., a cast-iron pipe interest of R. D. Wood & Co., has been sold at receivers' sale to Walter Wood of Philadelphia. The sale followed the decisions of the courts in the action brought by certain creditors, and it is stated realized only enough to insure a 50 per cent dividend. Mr. Wood, desiring that all creditors be paid, has made an offer to see that all who are willing to give him time to do so will have their claims paid in full. Under the receivership the Florence Iron Works property has been operated at a profit. The application for receivers was made on behalf of the company to conserve the property pending the settlement of an estate.

An inspection of the Wilmington Steel Company plant, Wilmington, Del. [formerly Diamond State Steel Works], was made on July 11 by William E. Corey, president of the Midvale Steel & Ordnance Company, A. C. Dinkey, vice-president of the company, and others.

Machinery Markets and News of the Works

INDIVIDUAL ORDERS SMALL

Standard Tools Are in Steady Demand

No Harmful Influence Yet Exerted by Resale Offerings—New York Firm to Build Small Arms Plant in Canada

New demand is nearer normal than it has been since the outbreak of the war, but there is a steady influx of orders for standard machine tools, though individually they are not large. It is notable that while comment is general on the offerings of second-hand tools, most of which have been used on munitions contracts, no actual injury to the trade in new machines is reported. At the same time, the existence in the market of much second-hand equipment makes dealers in both new and old tools incline toward caution in future commitments. On many types of tools, deliveries are still well off toward the end of the year.

The New York trade had a good week, although no large propositions are reported. In this market, munitions makers have made one or two purchases, as they have done elsewhere. It is announced that the Foreign Motors of America, Inc., will establish a factory within 100 miles of New York for the manufacture of an automobile formerly made in Belfast, Ireland.

Steel plants have placed several orders in Cleveland for heavy machines, but the market generally is quieter in that city.

Manufacturing plants in Cincinnati are busier than ever, and there is a good demand for standard tools. They are wanted quickly. Resale tools have not proved harmful. Similar conditions prevail in Milwaukee.

Chicago reports high building costs have not entirely caused a discontinuance of plant extensions or the building of new factories in that vicinity, all of which will require equipment.

In the Pacific Northwest, the shortage of ocean freight space is again becoming acute.

The Canadian Government will erect a small-arms plant at Lindsay, Ont., for which it has placed a contract with Westinghouse, Church, Kerr & Co., New York. It also is reported from Canada that the Imperial Munitions Board is negotiating with car builders in the Dominion for steel cars to be shipped to Russia, a move which is considered a step toward closer trade relations between Russia and Canada.

New York

NEW YORK, July 19, 1916.

The machine tool trade has enjoyed an active week, some very good orders having been placed, along with a large number of small ones, while a considerable amount of inquiry is still pending. Among the companies which have placed orders in the week are the Ashcroft Mfg. Company, New York, the New Departure Mfg. Company, Bristol, Conn., the Pennsylvania Railroad and Bartlett, Hayward & Co., Baltimore.

The Ashcroft Mfg. Company purchased 20 turret screw machines and is in the market for more. Bartlett, Hayward & Co. purchased 24 1-in. screw machines for their fuse de-

partment, indicating that not all the war buying is over. The Baltimore & Ohio Railroad is inquiring for a few tools, and the Michelin Tire Company, Milltown, N. J., is in the market for two boring mills.

Deliveries of some makes of the larger turret lathes and of planers, boring mills, automatic screw machines and milling machines cannot be made until near the end of the year, if new machines are wanted, but the second-hand market presents a large variety of tools, many of them only about one year old.

While the situation appears to be a healthy one, prominent members of the trade are inclined to proceed conservatively in view of the many resale offerings. It is a subject of comment that a few purchasers have seized pretexts which, in their minds, at least, justified them in refusing to accept deliveries. The same firms a few months ago would have made no serious protest if a tool reached them bearing minor defects or injuries received in transit, especially if it could be shown that the tool was perfect when it left the custody of the railroad. Cases of the kind have lately come to light.

The Fergus Motors of America, Inc., 80 Maiden Lane, New York, recently incorporated with a capital stock of \$2,000,000, plans the manufacture of an automobile, formerly manufactured by J. B. Ferguson, Ltd., Belfast, Ireland, which stopped its production there on account of war conditions. The English design will be considerably modified to meet American practice and it will be some six months before the company is in a position to begin manufacture. Its factory has not yet been decided on, but it will probably be located within 100 miles of New York City, and it is very likely that the company will erect its own plant. The company is not now ready to discuss machine tool needs and will not be for some time; but when ready will need considerable equipment. J. B. Ferguson, late managing director and principal stockholder of J. B. Ferguson, Ltd., Belfast, is president of the new company. W. H. Campbell, president of the Chas. Garrigues Company, 80 Maiden Lane, is vice-president, and S. T. Perrin, of W. E. Perrin & Son, 73 Maiden Lane, is treasurer.

The Scientific Machine & Tool Corporation, 210 Canal Street, New York, recently incorporated with a capital stock of \$5,000, has installed a new plant for the manufacture of special and labor-saving machinery, small tools, dies, etc. S. B. Beliaeff is president; F. Evertson is vice-president; G. A. Siff, secretary and C. Lewis, treasurer.

The Bound Brook Oil-less Bearing Company has taken over the Graphite Lubricating Company, manufacturer of bushings, bearings and washers, etc., Bound Brook, N. J. It has incorporated its former name in order to protect its business. G. O. Smalley is assistant general manager.

The Will & Baumer Company, candle maker, Syracuse, N. Y., plans an additional building, 75 x 175 ft., three stories, to cost about \$200,000 with equipment.

The Hanson & Van Winkle Company, manufacturer of electroplating materials, Newark, N. J., is building a four-story brick addition, 45 x 49 ft., to increase the capacity of its department for the manufacture of polishing compositions. It will install a number of labor-saving devices in the department. R. D. Foster is vice-president.

The Westchester Machine Company has been incorporated with a capital stock of \$10,000 by J. A. Bernstein, J. Peyser and J. Blank, and will take over the business of J. Peyser, machine designer, 448 Dunham Avenue, Mount Vernon, N. Y., doing a general machine-shop business, and also designing and building special machinery for sheet-metal, paper, wood, etc. It is in the market for a plain milling machine equal to a No. 2 Cincinnati. J. Blank is president and J. Peyser, secretary and treasurer.

The Buffalo Foundry & Machine Company, manufacturer of steam hammers, Buffalo, N. Y., decided on July 14 to delay construction of the proposed addition to its machine shop until next spring, and to go ahead with it at that time, if business remains as active as it is at present. The company cannot go ahead now, as it will interfere too much with its present operations. D. Bell is the company's engineer.

The plant of the Wilson Brothers' Iron Works, 1420 Grand Street, Hoboken, N. J., was damaged by fire recently, destroying its foundry.

The Peerless Tube Company, manufacturer of collapsible tubes, which recently moved its plant from New York City

to Bloomfield, N. J., has dissolved its corporation in New York State and incorporated in New Jersey. It retains its office at 253 Broadway, New York. George H. Neidlinger is president.

The Duryea Mfg. Company, foot of Chapel Avenue, Jersey City, N. J., manufacturer of woven belting, boiler compound, etc., has purchased several parcels of land on which it will erect factory buildings aggregating 50,000 sq. ft. of floor space, which will increase its manufacturing capacity about 200 per cent. It is planned to have the additions ready for operation May 1, 1917. The company has increased its capitalization from \$100,000 to \$500,000. B. L. Duryea is general manager.

The Goodman Machine & Tool Company, 50 Church Street, New York, has increased its capital stock from \$10,000 to \$25,000. It has obtained the manufacturing rights of the Scriven speed regulator for transmission work. The company requires no machinery at present, as its product is now being manufactured under contract. Louis Goodman is president and treasurer and Sigmund Muenz is secretary.

The plant of Weddingen & Meyer, manufacturers of farm implements, Throopsville, N. Y., recently badly damaged by fire, is to be rebuilt.

The Sintered Ore Company, Buffalo, is building an addition to its plant at the foot of Hamburg Street for a fan-room.

The Buffalo Metal Goods Company, Winchester and Northland avenues, Buffalo, N. Y., is taking bids for a two-story addition, 40 x 65 ft. W. F. Emerson is president.

A. A. Walrath & Son, machinists, Fort Plain, N. Y., have let contract for the construction of a two-story factory, 68 x 80 ft., to cost \$20,000.

The Empire Products Company, 316 Carroll Street, Elmira, N. Y., has let contracts for a cold-storage building, 70 x 70 ft., three stories, to cost \$25,000. T. W. Cleveland is president.

The New York Graphite Company, Niagara Falls, N. Y., has purchased a site of 20 acres, near the new electric power plant of the Buffalo General Electric Company on the Niagara River, just north of Buffalo, and will erect an extensive manufacturing plant.

The Reversible Trigger Lock Company, Gluck Building, Niagara Falls, N. Y., has let contract for a factory building, 50 x 100 ft., at Bath Street and Whirlpool Avenue. L. W. Bennett is manager.

The Coles Tools & Machine Company, Oneida, N. Y., will build a machine shop and garage, 60 x 140 ft., one story, to cost \$16,000.

The General Electric Company, Schenectady, N. Y., will erect from private plans a one-story building for the manufacture of turbines, at an estimated cost of \$60,000. C. G. Hulth is in charge of construction.

The C. A. Simons Machine Company, Albany, will erect a factory and machine shop, 125 x 131 ft., one story, of steel and brick.

The Coles Tool & Machine Company, Cedar Street, Oneida, N. Y., is having plans drawn for a one-story machine shop and garage, 60 x 140 ft., estimated to cost \$16,000. I. V. Van Buzor, Cazenovia, N. Y., architect, is taking bids.

The F. G. Schaefer Iron Works, Eighteenth Street and Hackensack Avenue, Weehawken, N. J., has established a structural steel shop consisting of a building 40 x 125 ft., on a site 200 x 400 ft., with railroad siding and adjacent to the docks. F. G. Schaefer, the proprietor, was formerly connected with the Hinkle Iron Company.

The report that the John A. Roebling's Sons Company, Trenton, N. J., has made plans for the rebuilding of its wire-rope shop, which was destroyed by fire in November, 1915, is incorrect. The company advises that it has not made any plans as yet.

The department of water supply, gas and electricity, Municipal Building, New York City, is having plans drawn for a three-story repair shop, tool shop and garage, 50 x 100 ft. William Williams is commissioner.

It is reported that bids are being asked for the construction of a six-story reinforced-concrete and stone factory building, 125 x 550 ft., to be erected at Watsessing Station, Bloomfield, N. J., for the Sprague Electrical Works of the General Electric Company.

J. G. White & Co., 43 Exchange Place, New York, are placing orders against an extensive list of machine tools for export for which they made inquiry some months ago.

Intimations are heard of contracts to be placed by the United States Government for shells in one case with an in-

dustrial company which may enlarge its facilities for the purpose.

Catalogs Wanted

The Scott Elevator Company, Getty Square, Yonkers, N. Y., has been incorporated with a capital stock of \$1,000,000 to manufacture electric elevators. It plans to build a factory in Yonkers; but the construction will not be undertaken for several months. In the meantime it will be pleased to receive printed matter from those in position to design and equip factory buildings and from machine-tool manufacturers. Campbell Scott is president, Louis Spreckels, vice-president and Elmer E. Gorton, secretary and treasurer. Anson Baldwin, Charles P. Easton, Daniel M. Hopping and Dan C. Nolan, with the officers, compose the board of directors.

Philadelphia

PHILADELPHIA, Pa., July 17, 1916.

An appropriation has been granted for the erection at the Frankford Arsenal, Philadelphia, of an ammunition factory to cost about \$100,000, and for an extension to the fuse shop to cost about \$123,300. Col. George Montgomery is the commanding officer.

A tank steamship will be launched at the plant of the Chester Shipbuilding Company, Chester, Pa., about the last of July. It is estimated that between Aug. 1, 1916, and Aug. 1, 1917, ten steamships, 375 ft. in length or over, will be constructed at the plant. The Chester and the Sun Shipbuilding companies have work for about 4000 men for the next two years.

In spite of the easier deliveries of machine tools, it is reported that the non-arrival of machinery is interfering with industrial development in Delaware County. The munitions factories in Eddystone have not received all their machinery, despite a year's effort in assembling thousands of machines. The Thurlow Steel Company, of Chester, on July 15, laid off 75 men of its day shift, and almost as many night workers, because of a lack of much-needed machinery. This is only temporary, for the company is booked with orders, the most notable of which is a sub-contract for machining shells for the French Government.

The property of the Philadelphia Electric Company, Philadelphia, is under appraisal to enable Drexel & Co. to finance its reorganization. Reports indicate plans to expand its facilities and the initiation of a progressive policy. While the new capitalization will not be known until after the Stone & Webster Engineering Corporation has submitted a report to Drexel & Co., it is rumored that the stock issue of \$25,000,000 will be doubled, with a readjustment of existing mortgage obligations. In this way funds will be provided to raise the efficiency of the plants by scrapping unnecessary units and constructing other plants.

The pattern storage building of the John E. Thropp's Sons Company, manufacturer of tire-making machinery, presses, etc., Trenton, N. J., was damaged by an incendiary fire July 7, with a loss of \$2,500 to the building and \$10,000 to the patterns.

Joseph Kopperman & Son, coppersmiths, 307 Florist Street, Philadelphia, have about completed plans for a two-story addition to their workshop, 57 x 95 ft., from plans by Frank E. Hahn, 1112 Chestnut Street.

The Hamilton Watch Company, Lancaster, Pa., has started the construction of a four-story addition, 52 x 153 ft., to cost about \$50,000. Charles F. Miller is president.

The Coopersburg Casket Company, Coopersburg, Pa., is reported to contemplate the erection of an addition to its plant to cost about \$10,000. W. L. Weirbach, South Bethlehem, Pa., is president.

The Salem & Penns Grove Traction Company, 378 Main Street, Pennsgrove, Pa., is awarding contracts for the construction of a one-story car shop and office, 32 x 127 ft., to be erected at Pennsville, N. J. Stern & Silverman, Land Title Building, Philadelphia, are the engineers.

Baltimore

BALTIMORE, Md., July 17, 1916.

The Ford Motor Company, Detroit, has leased the property of the Colonial Motor Company, 10 East North Avenue, Baltimore, and will probably build a new building for its local assembling plant.

Improvements to cost about \$250,000 are being contemplated at the plant of the Scott Paper Company, foot of Market Street, Chester, Pa. They will consist of the installation of additional machinery, the construction of a new building, the erection of an addition to the heater house and the construction of a bulkhead.

It is understood the International Steel Treating Company has taken over the property formerly used by the Tak-a-nap Soap Company, Darby, Pa., and will establish a plant.

The Colonial Glass Company, Petersburg, Va., has been organized with \$100,000 capital stock. D. W. Jacobs, Petersburg, is a stockholder.

A one-story mill building, 38 x 58 ft., will be built by the Baltimore Tube Company, Wicomico and Ostend streets, Baltimore.

Announcement has been made that a company formed in Wilmington, Del., will shortly begin the manufacture of a heater to be installed in automobiles. The patents have been transferred to David Reyam, of Wilmington.

New England

BOSTON, MASS., July 17, 1916.

In order to gain room for quick expansion pending the completion of permanent buildings, the Maxim Silencer Company, Hartford, Conn., is housing its welding department in a large tent. The addition now under way will give 18,000 ft. of additional floor space and later another building will be erected where the tent now stands. The offices have been removed from the main factory to a remodeled dwelling house at 81 and 83 Homestead Avenue.

The Boston Woven Hose & Rubber Company, Cambridge, Mass., has awarded a contract for the erection of an addition, 85 x 322 ft., four stories.

The Salem Iron Foundry, Salem, Mass., has been incorporated with capital stock of \$10,000. The directors are William S. McIntire, Salem, president and treasurer; P. F. Leonard and A. W. McIntire.

The American Brass Company, Waterbury, Conn., has awarded a contract for two additions to be erected on Washington Avenue, one 60 x 160 ft., the other 80 x 240 ft.

The Spray Engineering Company, Boston, Mass., has been incorporated with capital stock of \$100,000 by Lee H. Parker, John T. Clark, Bertrand R. T. Collins, Eastwood P. Thompson, Frederick F. Foster.

The Standard Auto Horn Company, Somerville, Mass., has been incorporated with capital stock of \$10,000 by E. Charles Drouet, Frederick W. Storack and Horace C. Hoskyns.

The Bantam Anti-Friction Company, Bantam, Conn., is having plans drawn by Fletcher-Thompson, Inc., Bridgeport, Conn., for an addition, 50 x 100 ft., two stories.

The Norton Company, Worcester, Mass., has awarded a contract for a service locker building, 40 x 118 ft., two stories.

The Remington Arms Union Metallic Cartridge Company, Bridgeport, Conn., has awarded a contract for an oil storage building, 40 x 64 ft., one story.

The Clark Brothers Bolt Company, Southington, Conn., has awarded a contract for an addition, 40 x 300 ft., one story.

The American Emery Wheel Works, Providence, R. I., is beginning the erection of a three-story addition, 50 x 90 ft.

The Hope Machine Company, Worcester, Mass., has been incorporated with capital stock of \$5,000. The directors are James V. Critchley, president; Edward L. Smith, 27 Victor Avenue, treasurer; and W. A. May.

The Worcester Pressed Steel Company, Worcester, Mass., is to build an addition, 34 x 36 ft., one story.

The North & Judd Mfg. Company, New Britain, Conn., has awarded contracts for a new power plant, including a powerhouse, 45 x 55 ft., and a turbine room, 37 x 53 ft., each about 45 ft. high. The boilerhouse will have suspended bunkers, automatic coal handling apparatus and stokers. The turbine room will have a traveling crane.

The Bristol Brass Company, Bristol, Conn., has awarded to the Austin Company, Bridgeport, Conn., the contract for a foundry, 62 x 250 ft. The company has also begun the construction of 35 houses for its workmen.

Work has been begun on the new electric power plant of the Coe Branch of the American Brass Company, Torrington, Conn., which will be completed in the early fall. It is reported that the additions to this plant in the past year have doubled its production. It is running night and day.

The D. & W. Fuse Company, Auburn, R. I., has awarded a contract for an addition, to cost about \$45,000.

The Worcester Brass Company, Worcester, Mass., has been incorporated with capital stock of \$10,000. The directors are James P. Doule, president; Patrick Doyle, treasurer, and A. E. Doyle.

Chicago

CHICAGO, ILL., July 17, 1916.

The higher cost of building seems not to have altogether discouraged the extension of factories and the machinery trade reports a fair quota of inquiry for tools occasioned by such increases in capacity. It is to be noted that in most instances these manufacturers, who will want tools of various kinds, believe they will be able to find what they need in the expected free offering of used machinery. Already inquiries have appeared, in connection with which this expectation is being largely relied upon. Offerings of second-hand tools which have been used in munitions operations are reported, however, to have been made thus far only in one or two instances. Except for the continuing scarcity of milling machines and grinders little insistent demand is evident for new tools.

The Albright-Nell Company, manufacturer of packing-house machinery, 4019 Wentworth Avenue, Chicago, has purchased property at Western Avenue and West Fifty-second Street, on which it will erect a building, which will be extensively equipped and will cost about \$80,000. The company will be in the market for a large lathe and two smaller lathes, a boring mill, planing machine and radial drilling machine and will install a 10-ton traveling crane of 40-ft. span.

The Hughes Electric Heating Company, 215 West Schiller Street, Chicago, George A. Hughes, president, is having plans prepared for a three-story factory to cost \$100,000.

The Holmes-Pyatt Company, 159 North Jefferson Street, Chicago, is letting the contracts for its new machine shop and factory, to be 125 x 216 ft.

The Herschfield-Piper Foundry & Machine Company, Chicago, has been organized by J. E. Lee, R. L. Wenstrand and Joseph Solari, 332 South Michigan Avenue.

The Interstate Oil & Pump Mfg. Company, Good Hope, Ill., has been incorporated with a capital stock of \$20,000 by J. E. Lowe, Frank Smith and others and will manufacture gasoline and other petroleum products.

The American Pole Protective Company, Freeport, Ill., has been incorporated with a capital stock of \$50,000 by S. M. Mulnix, W. M. Arnold and J. W. Stocks to manufacture iron and sheet-metal appliances.

The M. & N. Automatic Spark Plug Company, Cedar Rapids, Iowa, has been incorporated with a capital stock of \$100,000 to manufacture a self-cleaning spark plug. It states that it has received orders for more than 150,000 plugs. A. E. McDaniel is president; A. M. Bodwell, vice-president; H. F. Paar, secretary, and Valentine Nees, treasurer. It plans to manufacture its plugs at Cedar Rapids and is in the market for a second-hand automatic screw machine.

The Four S Razor Company will move to Hutchinson, Kan., from Ness City, and will erect a factory at Avenue A and Lorain Street, of concrete and steel, 80 x 260 ft., one story, to have about 14,000 sq. ft. of floor space. It is in the market for electric motors, punch presses and lathes. It maintains an office at 608 Rorabaugh-Wiley Building, Hutchinson. V. T. Miller is president.

The Specialty Mfg. Company, St. Paul, Minn., will build a two-story factory, 60 x 114 ft., to cost \$20,000. It can be reached in care of William Boss, 1049 Raymond Street.

The Fireproof Shingle Company, St. Paul, Minn., has been incorporated with a capital of \$50,000 by Henry Struchen, Edward Yanish and F. M. Kendrick. It will erect a plant as soon as a suitable site can be obtained.

The American Machine Products Company, Marshalltown, Iowa, has been incorporated with a capital of \$100,000 by E. A. Francis, J. W. Hook and J. Sidney Johnson.

Detroit

DETROIT, MICH., July 17, 1916.

The Brown & Schler Company, manufacturer of harness. Grand Rapids, Mich., will erect a five-story factory, 80 x 116 ft., of mill construction.

J. D. Chubb, 109 North Dearborn Street, Chicago, is preparing plans for a school and manual training institute at Calumet, Mich., 62 x 168 ft., three stories and basement, to cost \$100,000.

The Herriman Mfg. Company, South Haven, Mich., is erecting a foundry in connection with its machine shop.

The Home Furnace Company, Holland, Mich., has awarded contract to Ten Broeke & Sterenberg for the erection of a one-story factory, 100 x 260 ft., to cost about \$17,000.

The Acme Universal Joint Company, Kalamazoo, Mich., is having plans prepared for a new factory, 78 x 260 ft. E. D. Van Valkenburg is the architect.

The Plymouth Motor Castings Company, Plymouth, Mich., has increased its capital stock from \$10,000 to \$75,000.

The Reliance Engineering Company, Lansing, Mich., has purchased the equipment of the Hercules Forge Company of Indianapolis. This equipment will be taken to Lansing, where the company is fitting up a drop forging department with the intention of gradually taking on heavier work in steel.

Milwaukee

MILWAUKEE, WIS., July 17, 1916.

Milwaukee machine tool builders report a steady run of orders for standard equipment, and an almost total absence of special types for work such as that required by munition makers. Up to this time there seems to have been no bad results from the marketing of large lots of used tools by munitions contractors who have finished shell contracts. The demand is practically normal, and consists mainly of requirements for a general line of tools. Implement and automobile manufacturers are the principal source of business.

The Fish Oven Company, Walworth, Wis., manufacturing bakery supplies, has incorporated its business under the same style with a capital stock of \$7,500. The incorporators are C. G. Curless, W. D. Church and F. K. Blakely. For the present it will contract for its castings and do only assembling work; but later it is intended to erect a complete plant.

The Milwaukee Stamping Company, Sixty-fourth Street and Pullen Avenue, West Allis, Wis., has awarded all contracts for the erection of an addition to its plant, 72 x 122 ft. The work is well under way. The structural iron work has been let to the Ferdinand Pietsch Company, Milwaukee. The company recently increased its capital stock from \$115,000 to \$150,000.

The Geuder, Paeschke & Frey Company, Sixteenth and Canal streets, Milwaukee, maker of steel and sheet-metal stampings and specialties, is building an addition, 55 x 130 ft., to its plant.

The General Welding & Mfg. Company, 330 Oregon Street, Milwaukee, is taking bids for a brick addition, 35 x 70 ft. Charles J. Keller is the architect.

The Haysen Mfg. Company, Sheboygan, Wis., manufacturing bread-wrapping and bakers' machinery, will build a new plant on Winter Court, between Calumet Road and Thirteenth Street. The company has been crowded for room for several months.

The Bucyrus Company, South Milwaukee, Wis., is erecting an addition to its administration building, of brick and concrete, two stories.

The Wisconsin State Board of Control, Madison, Wis., will take bids until Aug. 16 for the construction of a sprinkler system for the State hospital for the insane at Oshkosh, Wis. The work includes a steam fire pump and auxiliary pump.

Wallace Poe, 905 Copeland Avenue, Beloit, Wis., has opened a garage and machine shop.

Stauffer & Kiel, owners of the Monroe Auto Company, Monroe, Wis., suffered heavy damage by fire July 7. Repairs are now being made. The company will purchase a list of small tools.

Indianapolis

INDIANAPOLIS, IND., July 17, 1916.

The Oakes Company, Indianapolis, manufacturer of metal stampings and automobile accessories, has increased its capital stock from \$175,000 to \$250,000.

The American High Speed Chain Company, Indianapolis, has increased its capital stock from \$25,000 to \$100,000.

The Hamilton Mfg. Company, Indianapolis, has been incorporated with \$15,000 capital stock to manufacture fuel feed systems. The directors are H. F. Rust, Charles O. Roemler and Bert C. Brown.

The Woodcraft Mfg. Company, Indianapolis, has been incorporated with \$10,000 capital stock to manufacture picture frames, wooden novelties, etc. The directors are Walter J. Kane, Reason D. Sanders and James A. Ross.

The Link-Belt Company, Indianapolis, has taken out a building permit for an extension to its plant, to cost \$20,000.

The Indiana Power & Water Company, Bloomfield, Ind., has been incorporated with \$200,000 capital stock to supply light, heat and power. The directors are A. Keene, C. E. Gregg and A. R. Coaker.

The American Motor Vehicle Company, Lafayette, Ind., has been incorporated with \$25,000 capital stock, to manufacture gasoline, electric and hand-propelled vehicles. Louis Marx, William M. Crockett and Jacob Wiesenthal are the directors.

King C. Gillette, of the Gillette Safety Razor Company, has bought the property of the Amplex Motor & Machine Works, South Bend, Ind. The plant will manufacture the Wilmo automobile manifold.

The Jay-Vee Differential Company, Indianapolis, has been incorporated with \$110,000 capital stock, to manufacture differentials. The directors are Harry B., William N. and Edward E. Gates.

The Remy Electric Company, Anderson, Ind., has plans for a three-story factory, 50 x 240 ft., to cost about \$30,000. F. L. Atwood is manager.

The Fort Wayne Engineering & Construction Company has been awarded the contract for erecting the new plant of the Fort Wayne Rendering Company, Fort Wayne, Ind., the building and equipment to cost about \$55,000.

The Evansville Veneer Company, Evansville, Ind., is erecting a plant, 125 x 170 ft., to replace one recently destroyed by fire. The latest machinery for this work is to be installed.

The International India Rubber Company, South Bend, Ind., has purchased property in that city on which it will erect a plant for the manufacture of automobile tires.

Cleveland

CLEVELAND, OHIO, July 17, 1916.

The demand for heavy machine tools has improved. Several inquiries for from two to three large machines have come from steel plants. Generally the market is rather quiet, although doubtless more active than usual at this time of the year. The buying of standard machines is mostly for early requirements. The demand for turret lathes has eased off so that makers have caught up slightly on deliveries, but cannot promise shipment within from two to six months. The demand for locomotive cranes is very heavy and some builders are three months or more behind on deliveries. A very active demand is noted for trolleys, hoists and other small types of handling equipment.

The Elyria Iron & Steel Company, Cleveland, will enlarge its local plant by the erection of a one-story steel frame and brick building, 158 x 208 ft. The new building will be used to increase the company's product of oxy-acetylene welded steel tubing. The building contract has been placed with the Austin Company, Cleveland.

The Torbenson Gear & Axle Company, Cleveland, has established a plant to manufacture internal gear drive truck axles in the buildings formerly occupied by the Austin Company, 152nd Street. The officers are V. V. Torbenson, president; W. J. Baxter, vice-president and J. D. Eaton, secretary and treasurer. The company will require lathes and drilling, milling and special machinery.

The W. S. Biddle Company, Cleveland, is enlarging its plant for the commercial heat treating of steel with an extension 40 x 55 ft. One new heat treating furnace 4 x 12 ft. 6 in. is being built by the company and a furnace of the same size now in use will be lengthened to 22 ft.

The Wire Products Company, Cleveland, has been incorporated with a capital stock of \$150,000 by W. W. Myers, J. S. Hurd, and others.

The American Automatic Connector Company, Cleveland, has been incorporated with a capital stock of \$100,000 by W. S. Russell, C. C. Townes, M. C. Portmann, and others, to manufacture hose couplers.

The Houghton Elevator & Machine Company, Toledo, which will build a one-story plant, 210 x 266 ft., will require some machinery.

The Firestone Tire & Rubber Company, Akron, has an inquiry out for nine electric travelling cranes for a plant extension. These include a 20-ton, a 10-ton, a 5-ton and six 2-ton cranes.

The Peerless Drawn Steel Company, Massillon, has about completed an extension to its plant, 88 x 120 ft., which will be used as a coil stock and annealing room.

The Trumbull Public Service Corporation, Warren, Ohio, plans an expenditure of \$250,000 in enlarging and rebuilding its water and power plants.

The Wilson Rubber Company, Canton, Ohio, has been incorporated with a capital stock of \$40,000 to manufacture rubber products and will establish a plant at 1320 Fifth Street. Fred J. Wilson and others are stockholders.

W. Bleckner and others are interested in a project to build a steel foundry at Canton, Ohio. It is stated a deal has practically been closed for a site.

The Canton Foundry & Machine Company, Canton, Ohio, has practically completed a brick addition, 25 x 60 ft., to its machine shop.

Cincinnati

CINCINNATI, OHIO, July 17, 1916.

Local manufacturing plants are said to be busier than at any previous midsummer period. It is stated that only a very small percentage of workmen are taking their usual vacations during the hot weather season, doubtless due to the satisfactory wages paid at the present time.

A few more second-hand machine tools are appearing, but the demand for new large lathes has not been affected in any manner, as only a few used machines of the larger sizes are available. Additional orders have been received lately from Canada, mostly for lathes, but orders now coming in are generally for single machines for rush shipment. Munition manufacturers in this country have not yet suspended purchases, while automobile and auto-truck manufacturers prove steady customers.

Corliss engine manufacturers, as well as makers of sugar machinery, are all very busy. The demand for sugar machinery from Cuba is especially good, and several large contracts were recently made. Some improvement is noted in the boiler and tank business.

The F. H. Lawson Company, Cincinnati, sheet-metal specialty manufacturer, will make an addition to its plant on Evans Street that will be 193 x 200 ft., three stories, of reinforced concrete construction. Considerable metal-working machinery will be installed.

The Ahrens-Fox Fire Engine Company, Cincinnati, will make an addition to its plant; but will require little additional equipment.

It is reported that the Dayton Irrigation Company, Dayton, Ohio, will erect a plant for the manufacture of sprayers.

The Westcott Motor Car Company, Springfield, Ohio, has commenced the installation of machinery in its new plant that is expected to be in operation at an early date.

The National Mortar & Supply Company, Pittsburgh, Pa., is reported to have bought the stone quarries of the Strunk-Meyer Company, located near Springfield, Ohio, and that it will expend a large sum for new equipment.

The Blackwood Foundry Company, Springfield, Ohio, announces that it expects to have its new plant in operation soon after Aug. 1. The company will make a specialty of steel castings.

The Shaw Wire Fence Company, Columbus, Ohio, is installing machinery in its new plant on Reynolds Avenue. Nearly all necessary equipment has been purchased.

The Phelps Mfg. Company, Columbus, Ohio, recently mentioned as being incorporated with \$100,000 capital stock, is fitting up a plant on South High Street for the manufacture of wire automobile wheels.

The Peters Buggy Company, Columbus, Ohio, is fitting up a new plant at Spruce Street and Dennison Avenue.

The Columbus Bread Company, Columbus, Ohio, will rebuild its large plant recently destroyed by fire with an estimated loss of \$25,000.

The B. C. Poston Mfg. Company, Chillicothe, Ohio, anticipates moving to more commodious quarters. Some wood-working equipment will be required.

Birmingham

BIRMINGHAM, ALA., July 17, 1916.

The high price of gasoline has had the effect of reducing the demand for gasoline engines. The lower prices for lumber have lessened the inquiry for sawmill supplies. Holidays and stock-taking have tended to curtail the wholesale machinery business during the past two weeks. The slack has been considerable. Wholesale machinery houses have, however, done a tremendous business in pumps following the floods in Alabama and adjacent territory. The quicker delivery of equipment is an encouraging factor. Hydroelectric apparatus is continuously active.

Noe-Axton Graphite Company, Pyriton, Ala., organized by A. D. Noe, plans to build a 100-ton graphite mill.

Birmingham Ice & Cold Storage Company, Birmingham, Ala., will add three stories and expend \$50,000 in additional cold storage capacity.

The Warrant Warehouse Company, Birmingham, will build a cotton compress at Ensley at a cost of \$75,000.

The Tucker Implement Company, Greensboro, Ala., has been incorporated with a capital stock of \$100,000 by J. C. Tucker, A. B. and F. M. Evins.

The Mutual Light & Water Company, Brunswick, Ga., plans to issue \$162,000 of additional capital for plant addition, etc.

The Johnson Boiler Works, Jacksonville, Fla., has been

incorporated with a capital stock of \$10,000 by C. P. Kendall, L. J. Johnson and A. C. Poole.

The D. B. Sharp Machinery Company, Jacksonville, Fla., has been incorporated with a capital stock of \$25,000, by D. B. Sharp, F. J. Brock and B. H. Tupper.

The Southern Sewer Pipe Company, Birmingham, will rebuild its plant, burned in 1914, and will manufacture double-strength shale highway and railroad pipe, vitrified sewer pipe, etc. Walter S. Dickey is president and F. L. Dickey, general manager.

The Madras Marble Company, of New York, capitalized at \$1,000,000, has been incorporated and has bought 91 acres of marble land near Sylacauga, Ala., which it will quarry.

St. Louis

ST. LOUIS, MO., July 17, 1916.

Machine-tool dealers report business good, although the market is receiving no lists of any size. The transactions are altogether in single tools, mostly standard equipment. A little inquiry for special machinery has come forth. Inasmuch none of the business in the past two years has been on war munitions equipment, but altogether tools for domestic industries this market is not feeling, except indirectly, the effect of offers of resale machinery. The fall outlook indicates good business in all lines throughout this territory.

The Prewett Addometer Mfg. Company, St. Louis, Mo., has been incorporated with a capital stock of \$75,000 by C. W. Prewett, John M. Harris and H. P. Mueller to manufacture adding machines.

The Robinson Motor Car Garage Company's plant at 3730 Sullivan Avenue, was destroyed by fire with a loss of \$50,000. A considerable portion of this was on machine shop equipment, which will be replaced.

The Jenkins Vulcan Springs Company, St. Louis, has increased its capital stock by \$56,000 to increase its manufacturing capacity.

The Busch-Sulzer Brothers Diesel Engine Company, St. Louis, has completed plans for the construction of an addition to its plant.

The Western Stamping Company, St. Louis, has been incorporated with a capital stock of \$25,000 and has purchased a plant, but will install additional machinery. Victor H. Handschug is president and A. Sabor, manager.

The Kansas City Weed Exterminator Company, Kansas City, Mo., has been incorporated with a capital stock of \$12,000 by U. Epperson, Lee Haney and H. A. Thompson to manufacture weed exterminating equipment.

The Gibson Motor Car Company, Webster Groves, Mo., has increased its capital by \$5,000 to add to its repair shop and machine shop equipment.

The Western Chandelier Company, Kansas City, Mo., has increased its capital to increase its manufacturing capacity and equipment.

Chaffee, Mo., will equip a waterworks plant to cost about \$34,000, and will receive bids for machinery until July 28. A pumping station with oil-driven triplex pumps is specified.

The plant of the Rogers Foundry & Machine Company, at Tenth and Pearl streets, Joplin, Mo., has been burned with a loss of \$65,000. The plant will be rebuilt and the equipment replaced.

The Mid West Iron Company, Commerce Building, Kansas City, Mo., is reported in the market for a 15-ton bucket-handling crane, a clam shell bucket, a double truck locomotive, movable towers, etc.

A. Smith, Pine Bluff, Ark., is reported in the market for machinery for the manufacture of collapsible metal tubing.

The Machine Service Company, Oklahoma City, Okla., has been incorporated with a capital stock of \$50,000 by Charles A. Tappan, H. E. Kanaga and Ed. M. Semans, and will equip a machine shop and repair plant.

J. F. Pitt, Tulsa, Okla., will erect and equip a machine shop and repair plant for automobiles to cost about \$10,000.

The St. Louis & San Francisco Railroad Company, V. K. Hendricks, engineer, St. Louis, Mo., plans machine-shop and roundhouse improvements at Oklahoma City, Okla., to cost about \$250,000. Electrically-operated coal chutes are specified.

C. O. Wilkins, Jackson, Miss., will equip a garage, machine and repair shop, 50 x 140 ft., and is in the market for machinery.

Clinton, Miss., is in the market for a pump for its water works plant. R. R. Hardy is town clerk.

The McNary Lumber Company's sawmill at McNary, La., has been burned with a loss of about \$200,000, of which \$50,000 was on equipment which will be replaced.

The Port Commissioners, New Orleans, La., will add about 1,000,000 bu. capacity to its elevator capacity, and will install additional equipment.

The Central South

LOUISVILLE, KY., July 17, 1916.

No diminution in the volume of machinery business offered in the Louisville trade is noted. Some business, withdrawn previously because of inability to handle it, is now coming back. Contractors' machinery and supplies continue good. Electrical motors, generators, etc., are sold ahead for two months and the machine-tool requirement seems to show no sign of slackening.

A garage to cost \$15,000 is to be erected at 909 South Third Street by the Thierman Realty Company, 219 West Main Street.

The Louisville Fire Brick Company is increasing the capacity of its plant at Grahn, Ky., installing boiler, grinding pans, dry blower and brick machine.

The Kentucky Distilleries & Warehouse Company, Mellwood and Gregory streets, Louisville, will build a boiler room at its plant, at an estimated cost of \$10,965.

Albert Kraetzer, Louisville, and F. M. and C. E. Platter, North Vernon, Ind., have incorporated the American Preparator Company, with \$5,000 capitalization, to manufacture equipment for lumber mills, etc. The debt limit is \$50,000.

The Frankfort Milling Company, Frankfort, Ky., is considering changing over to electric drive. The existing steam plant is inadequate. J. N. Moreland is proprietor.

Additional equipment for the plant of the Lexington Utilities Company, Lexington, Ky., will be purchased after the company buys the new franchise, probably on Aug. 1. The boiler room is being extended 50 per cent and a new 500-hp. boiler being added. F. W. Bacon is vice-president and general manager.

Harry Wallace, E. C. Phelps, and others, have incorporated with \$10,000 capital the Equi-Light Company, Paducah, Ky., to make automobile accessories. Capital is \$10,000.

Sherley Maston has purchased the interest of Leonard Bridges in the Dixie Highway Motor Company, Georgetown, Ky.

New equipment estimated to cost \$250,000 will be installed in the proposed plant of the Cumberland Mountain Minerals Company, Cumberland Gap, Tenn., for manufacturing cement. Equipment to be purchased includes three 1000-hp. steam engines; eight 300-hp. water-tube boilers; three 600-kw. sixty-cycle generators; 160 of sixty-cycle type and 5 to 200 hp. motors, coal-burning equipment for kilns, etc. Victor Buettner, Knoxville, Tenn. is president.

The American Metallic Packing Company, Lexington, Ky., is in the market for a used 1000 to 1200 cu. ft. air compressor, steam-driven.

Roundhouse, shops and yard extensions are included in the plans of the Pennsylvania Railroad in connection with bridge reconstruction at Jeffersonville, Ind., and Louisville. H. E. Newcomet is superintendent of the Louisville division.

A new pumping station and powerhouse are being constructed at the Indiana State Penal Farm, Putnamville, Ind.

Extensive improvements are to be undertaken by the Aluminum Ore Company of America at Memphis, Tenn., where a site for a terminal shipping and ore-handling plant has been purchased. C. B. Fox, general superintendent, East St. Louis, Ill., negotiated the purchase.

Texas

AUSTIN, TEX., July 15, 1916.

An increase in the demand for machinery and equipment for cotton-seed oil mills and gins is one of the features of the week's trade. Crop conditions remain about as promising as they could be.

The Davis Milk Machinery Company, Dallas, plans to build an assembling plant. L. S. Davis is Southwestern manager.

The Texas Power & Light Company, Dallas, which recently increased its capital stock from \$13,000,000 to \$14,000,000, plans to build an additional generating station at Austin. Fred Slater, New York City, has been elected vice-president and general manager.

The Texas Electric Railway Company, Dallas, has been incorporated with a capital stock of \$10,500,000 to take over the holdings of the Texas Traction Company, now operating an interurban electric railway from Dallas to Denison, and of the Southern Traction Company, now operating an interurban line between Dallas and Waco, and between Dallas and Corsicana. The new company is authorized in its new

charter to extend the merged system over 525 miles. It will also take over the street railway systems of Denison, Sherman, McKinney, Waxahachie, Corsicana and Waco. The incorporators are J. F. Strickland, M. B. Templeton and Osce Goodwin, all of Dallas. The Texas Electric Company is a subsidiary of the General Electric Company.

The Ballinger Cotton Company, Ballinger, has increased its capital stock from \$50,000 to \$75,000 for the purpose of enlarging its cotton-seed oilmill.

The Winters Cotton Oil Company, Winters, which has increased its capital stock from \$64,000 to \$75,000, will enlarge its cotton-seed oilmill.

The People's Cotton Oil Company, Sweetwater, will build a cotton-seed oilmill at a cost of about \$50,000. F. J. Phillips is a stockholder.

The United States Indestructible Tile Mfg. Company will construct a plant at Eagle Pass for the manufacture of tile and clay products at a cost of about \$100,000. W. F. Foust is a stockholder.

The Wichita Falls Motor Company, Wichita Falls, will enlarge its motor truck factory at a cost of about \$300,000.

The Chevrolet Motor Company of Texas has purchased a site at Fort Worth for its proposed assembling plant. A. B. Hardy is president.

The Pacific Northwest

SEATTLE, WASH., July 11, 1916.

Once again the shortage in ocean tonnage is being strongly felt by Northwest shippers. This is particularly true in the Puget Sound-West Coast trade. W. R. Grace & Co., with offices in Seattle, have practically handled this entire business since the outbreak of the European war; but charters on some of their vessels have expired, and they find it impossible to replace the ships.

According to statistical figures prepared by the West Coast Lumbermen's Association, the Allies of Europe have spent, in the last fiscal year, more than \$1,500,000 in the purchase of Washington and Oregon spruce for the manufacture of aeroplanes. In this time the timber for aeroplanes has advanced in price between 46 and 65 per cent. The total amount of lumber logged to fill the above orders has been 500,000,000 ft., as it is necessary to log six to ten times as much spruce as the amount shipped, and the pieces used must be 60 to 75 ft. long without a blemish.

The lumber mills in western Oregon and Washington, shut down for about ten days at the beginning of this month, are now resuming operations. Considerable replacement of machinery is going on during this slack period, as renewed activity is expected in the fall; but mill and logging equipment is in much less demand than a few months ago. In other lines, however, there has been little curtailment, and some industries continue to expand. The construction of new shipbuilding plants is being rushed and result in numerous inquiries for machine tools. Many small shops have had more work than usual of late, and are coming out with many single-tool orders. Increasing business from these shops is expected as deliveries ease up.

The Seattle Construction & Drydock Company plans improvements amounting to about \$1,000,000, including construction of a floating drydock and the enlargement of the present drydock. J. V. Peterson is president.

The Seaborn Company, Tacoma, Wash., is starting work on two lumber vessels, both to be equipped with oil or gas engines.

The Silver Steel Tie Company, recently incorporated at Salt Lake City, Utah, with Joseph Silver as president, proposes to manufacture steel railroad ties.

The Huffschildt & Dugan Iron Works, Bend, Ore., was burned out recently.

The Ragged Top tungsten claims near Lovelock, Nev., have been taken over by H. M. Byllesby & Co., Chicago, Ill., who are preparing to build a new ore mill at a cost of about \$100,000.

The Hammond Lumber Company is putting in lumber-handling equipment at its yards on Humboldt Bay, Cal., to increase the capacity by 25 per cent, increasing its rail shipments by using the new Northwestern Pacific line.

Bids have been taken for the construction of the Lindsay-Strathmore Irrigation system, Lindsay, Cal., requiring two high-head pumping plants of 2250 aggregate hp. The units will consist of motors direct-connected with centrifugal pumps.

John Fox, owner of the Seattle-Astoria Iron Works, Seattle, Wash., who recently purchased the plant of the Astoria Iron Works in Astoria, Ore., has also purchased the plant and equipment of Frederickson & Brown Iron Works in Astoria. The two plants will be combined, and placed in operation, after a number of improvements have been made.

The Portland Stove Works, Portland, Ore., contemplates the construction of a new plant. Plans are now in course of preparation.

The Willamette Iron & Steel Works, Portland, will erect a boiler shop at North Seventeenth and Front streets to cost \$12,000.

The Great Falls Portland Cement Company, Great Falls, Mont., has recently been incorporated with a board of directors consisting of D. A. Morrison, Whitehall, Mont.; W. J. Price, Dillon, Ill.; W. S. Trueblood, York, Pa., and L. L. Callaway and J. C. E. Barker of Great Falls. It has acquired 500 acres of land near Great Falls for quarry purposes and plans the construction of a cement plant costing \$500,000, to be ready for use in 1917. The plant will be electrically operated, and will have an output of 1000 bbl. daily.

The Boise Cold Storage Company, Boise, Idaho, has announced that it will begin construction of an ice plant to replace the plant destroyed by fire some weeks ago. The new plant will have an increased capacity, the storehouse to contain 7500 tons, and will cost approximately \$60,000.

Capt. Ennis Dobbins, Seattle, is considering the construction of a factory in Medford, Ore., for the construction of mining dredges.

The Red Collar Line, Coeur d'Alene, Idaho, plans to immediately construct a passenger boat for lake operation, to be equipped with two 200-hp. Winton marine engines.

The John Wilson Shipyard, Seattle, has been awarded contract by the Tacoma Dredging Company for the construction of a 110-ft. dredger, to cost \$70,000. It will replace one recently lost off Grays Harbor.

The Excelsior Mfg. Company, Eugene, Ore., plans the installation of additional machinery to be used in manufacturing excelsior pads for wrapping furniture, etc. Charles O. Peterson is president.

The Roundup Brick & Tile Company, Roundup, Mont., has purchased 80 acres of land and will erect there a brick and tile plant, with a daily capacity of 25,000 bricks. It will cost over \$50,000. M. M. Klein is president.

Canada

TORONTO, July 17, 1916.

The Imperial Munitions Board is negotiating with Canadian car makers for the manufacture of steel cars for Russia. This is the first time, as far as is known, that Russian orders for cars have been handled by the Imperial Munitions Board, and, it is understood, they mark the commencement of the practice. This change promises to prove a stepping stone in the development of trade between Canada and Russia. The extension of a further credit of \$25,000,000 is likely to be followed by another credit of similar amount at an early date. It has been reported that the Imperial Munitions Board has been placing contracts for war munitions amounting to upward of \$1,000,000 a day.

The Canadian Government will erect a new small arms ammunition plant at Lindsay, Ont., and has awarded the contract to Westinghouse Church Kerr & Co., New York.

The Canadian trade commissioner at Melbourne, Australia, has forwarded specifications to the Department of Trade and Commerce, Ottawa, for three-phase crane motors and controllers, single-phase shop motors and starter, 3 dry grinding machines, 2 beading and coping rolling machines, 2 tube swaging machines and other equipment required by the Victorian Railway at Melbourne and the New South Wales Railways, Sydney, Australia.

Brandon, Man., will purchase a 4,000,000-gal. high-duty pump. A. W. Shaw is superintendent of waterworks.

The William Davies Company, Ltd., 521 Front Street East, Toronto, is having plans prepared by Max Dunning of Chicago for the erection of an abattoir, cold storage plant, etc. It will include eight or ten buildings and will cost about \$1,250,000.

The St. Lawrence Wagon Company, 34 King Street, Montreal, will build a factory on King Street at a cost of \$7,000.

New equipment, including machine tools, will be installed in the plant being erected at Medicine Hat, Alberta, for the Dominion Harvester Company, to replace the one destroyed by fire.

The Queen City Oil Company, Notre Dame Street East, Montreal East, is in the market for a new 90 to 100-hp. locomotive boiler, completely equipped.

The R. & L. Mfg. Company, Ltd., Sherbrooke, Que., is in the market for a 3 to 5-hp., 550-volt, 60-cycle, three-phase motor.

Assiniboia, Sask., is in the market for an air compressor, a motor, a 150-hp. internal combustion engine, a generator, a switchboard, two pneumatic storage tanks and one oil

tank. The erection of a power station, installation of a heating plant, construction of reinforced concrete reservoir, etc., are planned. Bids must be in by Aug. 5. J. R. Nolan is secretary.

London, Ont., contemplates the construction of a sewage disposal plant to cost \$200,000.

The Edmonton, Dunvegan & British Columbia Railway, Edmonton, Alberta, will build a roundhouse at McLennan, Alberta, to replace the one recently destroyed by fire.

The Imperial Oil Company, 918 St. Patrick Street, Montreal, is considering the erection of an oil plant at Dartmouth, N. S., to cost \$5,000,000. It has secured a site of 460 acres, with 1300 ft. on the harbor front.

C. F. Smith will build a planing mill at Harrow, Ont., to cost \$10,000, and will install electrically-driven machinery.

Brown's Copper & Brass Rolling Mills, Ltd., Stop 21, Lake Shore Road, Mimico, Ont., is building a new mill to cost \$25,000.

Bids are being received by George D. Redmond, care the Chevrolet Motor Company, Oshawa, Ont., for a three-story, mill-construction factory. The estimated cost is \$50,000.

Alfred A. Viau, St. Jerome, Que., will build a foundry to cost \$6,000. L. T. J. Decary, 245 Centre Street, Montreal, is the architect.

The Pathe Freres Phonograph Company of Canada, Ltd., Toronto, has been incorporated with a capital stock of \$100,000 by Henry Pratt, John D. Bissett, 36 Toronto Street, Thomas H. Peine and others to manufacture phonographs, disks, etc.

Kingsville, Ont., will install a new pump at its waterworks. George Pearse is clerk.

Almonte, Ont., proposes to build a hydroelectric plant at a cost of \$18,000. J. T. Kirkland is clerk.

The plant of the Dominion Hardwood, Ltd., at Deseronto, Ont., which was totally destroyed by fire July 9, with a loss of \$100,000, will be rebuilt.

The Western Dry Dock & Shipbuilding Company, Port Arthur, Ont., is building a pattern and electrical shop to replace one destroyed by fire. The buildings will cost \$25,000.

The Giberson Stone Company is building a new plant at Point Edward, near Sarnia, Ont., in which new machinery will be installed.

The Sydney Foundry & Machine Company proposes to build drydocks and a ship repairing plant at Sydney, N. S.

The Alberta Lumber Company, Vancouver, B. C., has received a permit to erect a 50 x 210-ft., two-story mill building at Sixth and Willow streets, to cost \$100,000.

The Canadian Conley Frog & Switch Company, Ltd., Port Arthur, Ont., has been incorporated with a capital stock of \$150,000 by William F. Langworthy, Gerald A. McTeigue, Jarvis L. McComber and others to manufacture frogs, switches, tools, machinery, etc.

The Thunder Bay Terminal Elevator Company, Ltd., Winnipeg, Man., has been incorporated with a capital stock of \$1,000,000, by Clarence B. Piper, Hugh Phillips, Charles S. A. Rogers and others to build and operate elevators, storage plants, cleaning plants, etc.

The Canadian Comstock Company, Ltd., Montreal, mechanical and hydraulic engineers, has been incorporated with a capital stock of \$40,000 by Arnold Wainwright, Aubrey H. Elder, Felix W. Hackett and others to build factories, plants, machinery, bridges, etc.

The Algoma Construction & Engineering Company, Ltd., Sault Ste. Marie, Ont., has been incorporated with a capital stock of \$100,000 by Alexander Taylor, 63 Kendal Avenue, Toronto; Rex E. Nicholson, Joseph G. Gibson, 36 Prospect Avenue, and others, to manufacture iron, steel, nickel, metals, etc.

Government Purchases

WASHINGTON, D. C., July 17, 1916.

Bids will be received by the Bureau of Supplies and Accounts, Navy Department, Washington, until date not set, schedule 9894, for one buffing lathe for Brooklyn; schedule 9898, for one 18-in. x 8 ft. engine lathe for Puget Sound; schedule 9902, for one boring, drilling and milling machine for Washington; schedule 9903, for six air compressors, f.o.b. works; schedule 9904, for one 12-ft. 6-in. power brake for Philadelphia; schedule 9905, for one screw cutting lathe for Brooklyn.

The purchasing agent of the Alaskan Engineering Commission, Seattle, Wash., will receive sealed proposals until July 28, under circular 198, for furnishing one 40-ton shop crane, one saw table complete, one adjustable bevel band-

saw, one four-sided molder, one jointer or buss planer and one patternmaker's lathe.

Bids were received by the Bureau of Supplies and Accounts, Navy Department, Washington, July 11, for supplies for the naval service as follows:

Schedule 9752, Construction and Repair.

Class 1, Mare Island—One set of plate-bending rolls—Bid 77, \$75,900.

Alternate—Same, f.o.b. works—Bid 18, \$83,850 and \$74,777; 77, \$65,750.

Schedule 9801, Construction and Repair.

Class 71, Charleston—One 4-ft. radial drilling machine—Bid 70, \$2,290; 77, \$1,480.

Class 72, Charleston—One 5-ton jib crane, with electric hoists—Bid 78, \$1,315.

Schedule 9803, Steam Engineering.

Class 81, Portsmouth—Two gasoline engines—Bid 42, \$12,000.90; 75, \$5,368.50; 111, \$11,464.50; 121, \$10,298.90.

The names of the bidders and the numbers under which they are designated in the above list are as follows:

Bid 18, Bethlehem Steel Company; 42, Gas Engine & Power Company and Charles L. Seabury & Co.; 70, Manning, Maxwell & Moore, Inc.; 75, Mason Machine Works; 77, Niles-Bement-Pond Company; 111, Sterling Engine Company; 121, Van Blerck Motor Company.

NEW TRADE PUBLICATIONS

Manganese Steel Products.—American Steel Foundries, McCormick Building, Chicago, Ill. Calendar hanger, measuring $12\frac{1}{2} \times 26\frac{1}{2}$ in. Refers to the various products of the company, which include steel carwheels and locomotive, rolling mill, marine and railroad castings, etc. An illustration of one of these lines is given in the upper quarter of each sheet, while the remaining three quarters contains the calendars for the current, preceding and succeeding months.

Portable Electric Tools.—Chicago Pneumatic Tool Company, Fisher Building, Chicago, Ill. Bulletin No. E-41 superseding No. E-32. Calls attention to a line of portable electric tools designed especially for use on railroad work. These include track and side and center spindle drilling machines, grinding machines and machines for driving spikes. Brief descriptions of the various ones are given, the text being supplemented in some cases by engravings of the machines in actual use and condensed specification tables. A partial list of users of the tools completes the bulletin.

Wet Tool Grinding Machines.—Diamond Machine Company, P. O. Box 1188, Providence, R. I. Bulletin. Lists a line of wet tool grinding machines which are built in both the floor and bench types in 16 different sizes and styles. A general description of the two classes of machines is given, the text being supplemented by a number of engravings of different machines arranged for belt or motor drive. Condensed specification tables and a diagram of emery wheels and cross-sections of flanges are included.

Bolt Pointing, Threading and Tapping Machines.—Webster & Perks Tool Company, Springfield, Ohio. Catalog. Lists a line of pointing, threading and special tapping machines for bolts. The machines are of the horizontal type and in every case two pages are given to each, an engraving of the particular machine being presented on one page with a brief statement on the output, equipment and specifications on the facing one. Mention is made of a line of accessories, including dies, holders for stock, a rotary oil pump and automatic gripping and self-centering vise holders. A few samples of work threaded and tapped on the machines are shown and a table of speeds recommended for cutting bolts and tapping nuts is included.

Special Shovels.—Conneaut Shovel Company, Conneaut, Ohio. Pamphlet. Pertains to a line of shovels that have been developed for special purposes and are made only on order. Among the special tools mentioned are concrete, ore, contractors' and excavating shovels with long or short handles, coal scoops, etc. A number of views of the shovels in use and of the plant in which they are made are presented, together with a general description of the various operations involved in their manufacture.

Lathes.—Phoenix Mfg. Company, Eau Claire, Wis. Catalog. Relates to a line of lathes which includes standard, geared head and duplex helical drive engine lathes and a projectile lathe. All of the different machines are illustrated and the only descriptive matter included is some condensed specifications in the case of two or three of the lathes. A

drawing of the duplex helical drive is presented, together with an erecting diagram for one of the lathes.

Scales.—Standard Scale & Supply Company, Pittsburgh. Catalog No. 15. Presents illustrations and brief descriptions of an extensive line of scales that are built in a number of sizes and styles for all purposes. Lists of the various sizes in which each type can be supplied are given and a complete telegraph code is included.

Powdered Coal Equipment.—Bonnot Company, Canton, Ohio. Catalog. Covers the various pulverizing, crushing and drying machines required for use in connection with the Holbeck system for burning powdered coal. The uses of powdered coal and a brief description of the system are given, together with illustrations and brief descriptions of the various machines. A number of views of heating furnaces for plates, ingots, billets and rivets using this system of fuel are included.

Metal Cleaner.—J. B. Ford Company, Wyandotte, Mich. Booklet entitled "Metal and Other Cleaning Problems—Their Solution." Concerned with the cleaning of metals and metal articles for plating, japanning, galvanizing, painting, handling, assembling and inspection and also for the removal of Japan, lacquer, etc. After a brief discussion of the metal cleaning problem, directions for cleaning metal articles of various kinds are presented and a number of suggestions on the use of the company's metal cleaner are presented. Mention is made of a number of other cleaners that can be supplied.

Forging Furnace.—Metals Production Equipment Company, 105 West Fortieth Street, New York. Bulletin No. 35. Describes a line of stationary forging furnaces, using gas or oil fuel, for heating material for forging with steam and drop hammers, hydraulic presses and bulldozers. Illustrations of both the single and double door types of furnaces are presented with brief specifications of the different sizes of each that can be supplied. A drawing of a typical installation for operation with a steel fan pressure blower and an engraving showing an installation of two-door furnaces are included.

Heat Resisting Metal.—Diamond Power Specialty Company, Detroit. Bulletin No. 118. Concerned with Insuluminum which is a new metal that has been developed by the General Electric Company in its research laboratories and will withstand a continuous temperature of 1800 deg. Fahr. A number of photomicrographs and photographs and records of a series of comparative high-temperature tests of pipes made from this new metal and from iron that were conducted by a number of well-known companies are included. The properties of the metal are described and the application of it to the company's mechanical soot blower system for which it has secured the sole right in the United States, is briefly touched upon.

Locomotive Cranes.—Brown Hoisting Machinery Company, Cleveland. Catalog I. Gives a brief description of the use and construction of a line of locomotive cranes and the special attachments that can be furnished for use with them. The bulk of the catalog is given over to engravings of various types of cranes in actual use, the caption in each case giving a brief statement of the work that is being done and any features of interest concerning it.

Factors of Safety in Automobiles

The factors of safety in the various parts of motor cars of different design vary from 1.2 in the case of the rear axle shaft of a certain car to 90.0 in the clutch shaft of another type, according to an investigation conducted on fourteen different types of cars by Russell Huff, consulting engineer, Packard Motor Car Company, Detroit. The results of the investigation are reported in a paper presented at the semi-annual meeting of the Society of Automobile Engineers, June 12, 1916. Studies were made on the front axles, front axle spindles, clutch shafts, transmission shafts, propeller shafts and rear axle shafts of these cars which ranged from a 1,900-lb., four-cylinder car to a three-ton truck.

In calculating the factors of safety, it was assumed that the steel in the various parts had been heat treated to give the same hardness, namely 210 Brinell. In studying front axles, the actual dead load resulting from a full complement of passengers, full gasoline, oil and water systems and spare tire equipment was used in making the calculations. In the study of the power transmission parts, the maximum engine torque, direct or geared up, irrespective of friction or gear losses, was used.

